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ABSTRACT

This paper presents a framework for evaluating the level and composition of public expenditures, illustrated by sectoral and country examples. The paper illustrates how this framework can be applied to analyzing broad allocations of spending within and across sectors, drawing upon some key findings and country examples from major sectors (health, education, infrastructure). The report emphasizes six elements which should be an integral part of an ongoing exercise to evaluate public spending. Those elements include: (1) the aggregate level of public spending and deficit of the consolidated public sector must be consistent with the macroeconomic framework; (2) aggregate spending should be allocated to programs within and across sectors to maximize social welfare, including the impact on the poor; (3) the role of the government versus the private sector ought to be a principal criterion governing the choice of programs for public financing and provision--public expenditures should complement rather than substitute for private sector activities; (4) the impact of key programs on the poor, including their incidence and total costs, should be analyzed; (5) the input mix, or the allocations for capital and recurrent expenditures, should be analyzed in an integrated manner within programs and sectors; and (6) budgetary institutions should be analyzed to insure that the underlying incentive structure contributes to aggregate fiscal discipline, allocative efficiency and equity in the composition of spending, and technical efficiency in the use of budgeted resources. Fifteen tables (out of 49) and 5 appendices (out of 17) deal with education-related data. The paper should be useful to policymakers in developing countries, staff in donor organizations, as well as researchers working on public expenditure issues. (Author/EH)

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Evaluating Public Spending

A Framework for Public Expenditure Reviews

Sanjay Pradhan

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Evaluating Public Spending

A Framework for Public Expenditure Reviews

Sanjay Pradhan

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FOREWORD

In recent years, there has been heightened concern about the allocation of public expenditures in developing countries. Forced by macroeconomic imbalances to cut aggregate spending, governments have been faced with difficult choices about how to restructure the composition of spending to meet aggregate fiscal targets. Donors have placed increasing emphasis on evaluating public expenditures that they are directly or indirectly financing. The World Bank undertakes Public Expenditure Reviews (PERs) in client countries to carry out such an evaluation. However, there is no systematic framework for public expenditure analysis. The academic literature provides little guidance. This paper presents a framework for evaluating the overall level and composition of expenditures. It illustrates how this framework can be applied to analyzing broad allocations of spending within and across sectors, drawing upon some key findings and country examples from major sectors (e.g., health, education, infrastructure).

The paper should be useful to policymakers in developing countries, staff in donor organizations, as well as researchers working on public expenditure issues.

Michael Bruno
Senior Vice President and Chief Economist

ABSTRACT

This paper presents a framework for evaluating the level and composition of public expenditures, illustrated by sectoral and country examples. It emphasizes six elements which should be an integral part of an ongoing exercise to evaluate public spending. First, the aggregate level of public spending and deficit of the consolidated public sector must be consistent with the macroeconomic framework. Second, aggregate spending should be allocated to programs within and across sectors to maximize social welfare, including the impact on the poor. Third, the role of the government versus the private sector ought to be a principal criterion governing the choice of programs for public financing and provision; public expenditures should complement rather than substitute for private sector activities. Fourth, the impact of key programs on the poor, including their incidence and total costs, should be analyzed. Fifth, the input mix, or the allocations for capital and recurrent expenditures, should be analyzed in an integrated manner within programs and sectors. Finally, budgetary institutions should be analyzed to ensure that the underlying incentive structure contributes to aggregate fiscal discipline, allocative efficiency and equity in the composition of spending, and technical efficiency in the use of budgeted resources.

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EXECUTIVE SUMMARY

In recent years, a confluence of factors has focused attention on the allocation of public expenditures. Macroeconomic imbalances in developing countries have underscored the need to cut spending and deficits. Governments have had to make difficult choices about where to cut spending, and how to allocate scarce resources to achieve societal goals for economic growth and poverty alleviation. Donors have also placed primacy on fiscal austerity in their support of adjustment programs. Further, since resources are fungible to some extent, there has been growing awareness that donors' preoccupation with the appraisal of their individual projects has been limiting. Consequently, donor conditionality has increasingly focused upon analyzing and restructuring public expenditure priorities for more efficient and equitable growth. The World Bank, for instance, has been devoting substantial resources to carrying out Public Expenditure Reviews (PERs) to analyze the allocation of spending in client countries.

Despite the heightened attention, there is no systematic framework or methodology for carrying out public expenditure analysis. There is little guidance from the academic literature. A review of Bank PERs found them to be uneven in quality. Many did not use any explicit criteria to analyze public spending; they did not analyze relevant expenditure categories (e.g., major programs within sectors); and they neither analyzed institutional processes nor followed-up to build government capacity in client countries. Some recent PERs are, however, redressing these shortcomings.

This paper presents a framework for evaluating the level and composition of public expenditures. It applies this framework to analyzing intrasectoral allocations within key sectors (e.g., health, education, infrastructure, agriculture), intersectoral allocations across sectors (including defense), as well as allocations for major cross-sectoral expenditure categories (e.g., the public investment program, the wage bill, operations and maintenance). The objective is to show how an overall framework for expenditure analysis can be applied to analyzing broad allocations within and across sectors, drawing upon some key findings and country examples from major sectors. Since the approach is *illustrative*, the paper does not intend or pretend to provide a comprehensive review of each sector. Although the principal focus is on allocational issues, the paper also highlights the importance of the institutional "policy environment" that determines these expenditure allocations and their outcomes. Consequently, the paper concludes by presenting a framework and an associated methodology for diagnosing the underlying budgetary institutions, illustrated once again with country examples.

Overall, the paper emphasizes six elements which should be an integral part of an ongoing exercise to analyze the level and composition of public spending.

- *First*, the aggregate level of public spending and deficit must be consistent with the medium-term macroeconomic framework, yielding a sustainable deficit and public debt. In analyzing the sustainability of the deficit, the definition of the public sector needs to be comprehensive, particularly if a significant part of the public sector deficit is borne by or has been shifted to other levels of government, extrabudgetary funds, public enterprises or even the financial sector.

- *Second*, this aggregate spending should be allocated within and across sectors to maximize social welfare, including the impact on the poor. In this context, it is easier to analyze intrasectoral allocations (or allocations within a sector), before dealing with complex comparisons of benefits across sectors in intersectoral analysis. Within sectors, identification of major programs, or sets of expenditures with relatively homogeneous benefits (e.g., primary, secondary and university education; public health; basic and advanced tertiary health care), provides a useful unit for expenditure analysis.

- *Third*, the role of the government versus the private sector ought to be a principal criterion governing the choice of programs for public financing and provision. Public expenditures should fund programs that make the most contribution to social welfare relative to what the private sector can do, rather than merely substituting for or even marginally improving upon private sector activities and outcomes. This requires assessing the determinants of demand and supply to identify the nature and magnitude of specific market failures, which in turn would indicate the scope for private financing and delivery as well as the form of appropriate government intervention—regulation, financing or outright provision. Restructuring the composition of public spending away from private goods and towards core public goods and services can provide considerable mileage in many countries. Public expenditures in many developing countries are still financing the provision of private goods and services which can be provided in the private market—not only in industry and agriculture, but also within health, education and infrastructure. At the same time, core government activities that provide public goods, large externalities and benefits to the poor (e.g., public health, primary education, an adequately maintained road network), which the private market will underprovide or not provide at all, are often grossly underfunded.

- *Fourth*, the impact of key programs on the poor should be analyzed, including their incidence and total costs, to identify those which help achieve poverty alleviation objectives cost-effectively. Several so-called anti-poverty programs may in fact benefit the well-off, and may end up providing only limited benefits to the poor once their cost of participation and other behavioral responses are factored in. More broadly, the relative allocations within and across programs should achieve the mix of corresponding sectoral outcomes that maximize social welfare. Consequently, the relationship between program expenditures (e.g., primary education expenditures) and their outcomes (e.g., educational performance), rather than mere trends or international comparisons of expenditure ratios, should be the basis for allocating resources to achieve socially desirable outcomes.

- *Fifth*, the input mix, or the allocations for capital and recurrent expenditures, should be analyzed in an integrated manner within programs and sectors to address the shortcomings of traditional capital-led budgeting with unsustainable recurrent cost requirements and the crowding out of non-wage operations and maintenance (O&M) by wage expenditures. This requires weeding out capital and recurrent expenditures of undesirable programs, and within the major remaining programs, assessing the recurrent costs of existing and new investments, the non-wage O&M requirements, the extent of civil service overstaffing, and the adequacy of civil service pay.

- Finally, and perhaps most important, the public expenditure review exercise should seek to build government capacity and ownership so that the exercise can be undertaken by the policymakers themselves as an integral part of their planning, budgeting and evaluation system. More broadly, budgetary institutions should be analyzed and reformed to ensure that incentives, formal and informal rules and capacities contribute to the control of aggregate spending, prioritization of aggregate spending to achieve allocative efficiency and equity, and technical efficiency in the use of budgeted resources. Particular emphasis should be placed upon assessing the transparency and accountability features of the system which bind key players in government to achieving these socially desirable results at the macro and micro levels.

The resulting agenda for public expenditure analysis is ambitious. This reflects the inevitably vast scope and complexity of an exercise to analyze the allocation of public spending. However, the paper also points to methodologies, criteria and relatively robust stylized facts that can economize on data and analysis, help identify egregious imbalances, and make manageable an otherwise overwhelming task. In view of the analytical and empirical complexities which will nevertheless remain, there should be no presumption to evaluate public spending in one exercise or a single public expenditure review. Rather, the emphasis should squarely be on

building government involvement, capacity and ownership so that policymakers undertake such an exercise themselves on an ongoing basis as an integral part of their public expenditure planning, budgeting and evaluation process. More fundamentally, the focus should be on improving incentives and institutional arrangements in the government's public expenditure management system to achieve better expenditure outcomes on a sustained basis. In this process, donors such as the World Bank can carry out focused, annual reviews on selected topics as part of a medium-term program of economic and sector work. In view of the centrality of the public-private interface and the blurring of public-private dichotomy in all key sectors as further discussed below, such reviews should not be confined to analyzing public expenditures alone, as other forms of government intervention (e.g., contracting and regulation of the private sector) may be equally important policy options to evaluate. The objective should therefore be to move towards an ongoing assessment of the appropriate role of the public sector within and across sectors, including an assessment of regulation, public expenditures and institutional arrangements.

Framework for evaluating public spending

Although the principal focus of this paper is on analyzing the composition of public spending, the starting point for such an analysis is an evaluation of the aggregate level of spending.

The macroeconomic framework and the aggregate level of spending

The *aggregate level of spending* must be consistent with the macroeconomic framework; otherwise, high or rising budget deficits will result in particular macroeconomic imbalances depending upon how they are financed. For instance, if financed through excessive external borrowing, they can lead to a debt crisis; excessive use of foreign reserves leads to crises in the balance of payments; printing money excessively leads to inflation; and too much domestic borrowing leads to higher real interest rates, and crowding out of the private sector. Cross-country evidence shows that stable and low fiscal deficits have been associated with higher growth, investment and current account balances. The permissible aggregate level of spending depends upon the *sustainable budget deficit* and *the composition of that deficit*. To calculate the sustainable deficit, future projections of debt to GDP need to be made, given assumptions about the demand function of money, the desired inflation rate, the real interest rate, and the growth rate of the economy. The deficit is unsustainable if the debt to GDP ratio is projected to grow in the future, as for instance some recent projections in Guinea showed.

In analyzing the sustainability of the deficit, the definition of the public sector needs to be as comprehensive as feasible, particularly if a significant part of the public sector deficit is borne by or has been shifted to other levels of government or even the financial sector. The consolidated deficit can be calculated by adding the deficits of the various types of public entities, excluding transfers among these entities. In principle, this should include not only central government, but also state/local governments (particularly in federal structures), social security and extrabudgetary funds. Clearly, such consolidation will be constrained by available data in many countries. However, the failure to consolidate key components in particular countries can seriously distort the macroeconomic consistency of the expenditure framework. For instance, extrabudgetary funds constituted a massive 12 percent of GDP in Ukraine in 1992. In addition, if there are significant deficits and liabilities of public enterprises and even state-owned banks in the financial sector, they are ultimately borne by the government and therefore need to be added to the public sector deficit. For instance, in Bulgaria in 1993, adding the losses of the banking system on account of subsidies on the government's domestic debt helped explain the persistence of inflation in the face of what otherwise appeared to be a moderate fiscal deficit. In certain circumstances, even quasi-fiscal deficits of the Central Bank can be quite critical in analyzing the macroeconomic impact of government deficits (e.g., the 1995 Mexican crisis).

Given a sustainable deficit, the composition of that deficit—i.e., the revenue-expenditure mix—needs to be analyzed. For instance, a recent review of public expenditures for Namibia analyzed four alternative combinations of revenue increases and spending cuts to show that disproportionate reliance on either to meet the deficit target would be infeasible and undesirable. In evaluating the composition of the deficit, the sustainable revenue can be calculated as the revenue consistent with the tax structure with minimum distortionary costs, or consistent with revenues of other countries with similar tax structures. However, the maximum permissible spending that results as a residual from the sustainable deficit and revenue need not be optimal if it crowds out more efficient private sector spending. For instance, the assessment of the role of government versus the private sector within and across sectors, as further discussed below, can conceivably reveal that aggregate spending, and hence taxes, can be reduced even below its maximum permissible level. In some circumstances (e.g., in post-civil war Uganda during the late 1980s), the exercise can even reveal that the maximum permissible level of spending is insufficient and therefore inconsistent with the rehabilitation needs to meet the growth and poverty alleviation objectives; additional borrowing in such circumstances need not lead to an unsustainable debt burden. Consequently, the aggregate level of spending must result from an iteration between the maximum permissible spending and the analysis of the social desirability of the composition of that spending using the criteria governing expenditure choice, as further discussed below.

Framework for analyzing the composition of spending

The bulk of this paper focuses on the *composition* of a given aggregate level of spending. The composition of public expenditures should finance the mix of goods and services that maximize social welfare. In principle, this implies that the present or proposed allocations of expenditures be assessed using a three-step analysis or criteria for expenditure choice. The first two correspond to the *efficiency* criterion, while the third is concerned with *equity*.

- *First*, is there is a rationale for government intervention in general and public expenditure in particular in the area to address underlying market failures? Public expenditures should be concentrated first on goods and services that the private market will not provide or provide too little, rather than merely substituting for or even marginally improving upon the private market outcome. This requires identifying the characteristics of demand and supply to assess whether there are specific market failures (e.g., public goods, externalities, non-competitive markets) causing the private market outcomes to deviate from socially desirable ones. The type of market failure will indicate the scope for private financing and delivery, and therefore the form that government intervention should take—regulation, financing or outright provision. For instance, while economic principles would suggest that pure public goods (i.e., zero marginal cost of additional consumption) be financed wholly by the public sector, several other publicly-provided goods and services provide at least some private benefits which can be recovered from the private sector, albeit with subsidies to achieve socially desirable outcomes (e.g., for positive externalities, to cover losses from decreasing cost industries where marginal cost is below average cost). Consequently, the scope for private sector financing and/or delivery, together with concomitant reforms in the pricing and regulatory framework, needs to be fully evaluated as a principal, initial criterion in screening public expenditure allocations.

- *Second*, if there is an underlying market failure, how large is the discrepancy between social and private values this imposes and therefore how much can alternative expenditure allocations (including subsidies from pricing policy) improve upon the private market? In other words, the social cost-benefit of alternative expenditure allocations needs to be computed so as to select those that maximize the net contribution to social welfare. This requires information on the determinants of demand (e.g., willingness to pay, price elasticity of demand, consumer ignorance, externalities) and supply (e.g., size of private sector, performance, substitutability between public and private sectors) to measure the net social impact of expenditure allocations (including subsidies resulting from pricing policies) on private

consumption and supply. Consequently, the outcomes of alternative expenditure allocations or inputs (net of their impact on private supply, if any) need to be identified, and the social valuation of alternative outcome-input combinations need to be compared. The traditional theory of public finance sought to evaluate expenditures using shadow prices to value inputs and outcomes.

- *Third*, since cost-benefit analysis has traditionally not taken into account distributional weights, the impact on the poor of alternative expenditure allocations needs to be taken into account to ensure that the composition of spending helps meet the poverty alleviation objectives. This can be accomplished through various methodologies. One commonly used method is benefit-incidence analysis, which uses household surveys to rank everyone by some measure of well-being (e.g., consumption, income), estimates the average use of the relevant public service, uses public expenditure on that service as the proxy for benefits received, and thereby attempts to compare well-being before and after the intervention. It is important to underscore, however, that many incidence analyses have important limitations. The costs of programs are an inadequate proxy for benefits received, and these studies typically do not take into account the total costs of expenditure programs, including administrative costs, participation costs of the poor and other behavioral responses. However, behavioral approaches can be quite demanding on data, and the usual benefit incidence analyses constitute a useful, first approximation.

In practice, applying the above criteria to the gamut of public expenditure allocations is infeasible. Indeed, given information and capacity constraints in most developing countries, it would be impossible to rigorously apply these criteria to any meaningful fraction of the capital investments and recurrent programs that comprise a country's overall expenditure program. The principal challenge therefore lies in choosing the level and scope of analysis consistent with available information and capacity, and which nevertheless provides useful insights for expenditure analysis. And this is also a principal focus of this paper.

As already summarized and as further explained below, the paper suggests that some egregious expenditure imbalances can often be identified using a few easily applicable criteria and relatively robust stylized facts—e.g., public-private roles, intrasectoral analysis, input mix imbalances, benefit incidence analysis, institutional diagnosis. In addition to these, a usual temptation is to use international comparisons of expenditure ratios and outcomes to identify imbalances in a country's expenditure composition. To a limited extent, this can provide some initial, useful insights. For instance, a comparison of key sectoral outcomes with countries of comparable levels of development can reveal worrisome anomalies (e.g., poor social indicators in Brazil and Pakistan compared to countries of comparable GDP per capita), which may in part reflect underlying expenditure imbalances. In addition, unusually high or low shares of particular expenditure categories may point to *potential* underlying imbalances. The paper provides international averages for the share of major expenditures in total spending and GDP, as well as some international averages of social indicators. *However, it is critical to underscore that there is no optimal ratio or norm for expenditure allocations across countries.* The paper urges caution in mechanically using such ratios for expenditure analysis. Differences in relative prices, state of infrastructure, public-private roles, etc., make it difficult to meaningfully compare such ratios. Consequently, it would be erroneous to base expenditure assessments on such comparisons alone. At best, such comparisons may reveal gross anomalies in particular expenditure allocations, which then need to be analyzed in greater depth using the three-step analysis above.

To carry out such analysis for the vast gamut of expenditures, it becomes important to choose appropriate levels of aggregation and economically meaningful classifications so that conclusions about expenditure choice can be made based upon limited information and capacity. To this end, the IMF's GFS offers both *the functional classification* of expenditures, which is based upon the purpose or function toward which spending is directed, and includes expenditures by sector and sub-sectoral programs (e.g., health, primary education), and *the economic classification*, which is based upon the economic characteristics of transactions on which resources are spent (e.g., capital versus recurrent, and within recurrent, wage, non-wage operations and maintenance, interest payments, subsidies). It is useful to begin by compiling data on the functional and

economic composition of public expenditures, and even making some simple international comparisons to spot any glaring anomalies that need to be investigated in greater detail. Between these two, the paper argues that it is useful to begin with the functional classification because it is based on similar purpose or function or benefits. Indeed, it becomes difficult to analyze the economic composition at an aggregate level, e.g., aggregate allocations for capital investments, O&M, civil service employment, or subsidies, without a good knowledge of the functional composition in the first place. This is because more disaggregated knowledge is needed at the sectoral and program level about which public investments are socially undesirable, what is the evidence on underfunding of non-wage O&M in particular areas, and where there is overstaffing of the civil service. This may well reveal common patterns about the economic composition that cut across sectors. Consequently, the paper suggests starting with the functional composition, and analyzing the economic composition within and then across functional categories in an integrated manner.

In analyzing the functional composition of expenditures, it is important to ascertain the constitutional division of functional responsibilities among various levels of government (i.e., unitary, federal, cofederal), which will have a critical bearing on the nature of expenditure analysis. For instance, a federal form of government has a multi-tiered structure of decisionmaking, with the national government deciding about national public goods (defense), and subnational governments having independent or concurrent responsibility about local public services (e.g., basic health, primary and secondary education). Economic theory suggests that such decentralized decisionmaking can in principle enhance allocative efficiency and social welfare because lower levels of government may be better able to map expenditures to meet local preferences, provided economies of scale and benefit-cost spillovers have been taken into account. In such structures, it becomes imperative to analyze not only the assignment of expenditure functions and tax revenues across levels of government, but also the efficiency and equity implications of the design of intergovernmental fiscal transfers (e.g., block grants, specific-purpose grants, matching grants) to offset vertical and horizontal imbalances, interjurisdictional spillovers, etc. To keep its scope manageable, this paper does not focus on intergovernmental fiscal relations, but merely summarizes some key findings pertaining to intergovernmental transfers and institutional arrangements while referring to the large literature on the subject.

Analyzing the functional composition of expenditures

The functional composition consists of allocations across and within sectors, such as education, health, transport, defense. Starting from the highest level of aggregation, expenditure analysis needs to inform how a given aggregate level of spending should be allocated across sectors (i.e., intersectoral allocations) to maximize social welfare. This would imply carrying out the three-step analysis above for sectoral expenditures. However, applying the three criteria to aggregate sectoral expenditures suggest that only limited analysis of allocations across sectors, or intersectoral allocations can be made without first analyzing allocations within sectors, or intrasectoral allocations. While public expenditures in a sector such as industry are inappropriate because they finance the production of private goods without underlying market failures, the analysis is more complicated for other aggregated sectoral expenditures. This is because a sector contains expenditures with very different public-private roles, net benefits and impact on the poor. Consequently, it becomes difficult to analyze relative allocations across sectors, without analyzing relative allocations within sectors.

In this context, *a program as a set of expenditures within or across a sector with relatively homogeneous benefits* constitutes a useful unit of analysis. Given large interdependencies and externalities across sectors (e.g., mother's education improves children's nutrition), a program could well be a multisectoral set of expenditures aiming to achieve a particular set of benefits (e.g., reduced infant mortality, or integrated child development). For simplicity in exposition, however, the paper illustrates the application of the framework by concentrating first on relatively homogeneous programs within sectors, although as further discussed below, the same principles can be applied to multisectoral programs under intersectoral allocations. Key programs within

sectors are those that have relatively homogeneous underlying market failure, nature of benefits or impact on the poor. To begin with, this would imply identifying programs with different underlying market failures and rationale for public expenditures, and within this, disaggregation based upon the nature of net benefits or the impact on the poor. The greater the homogeneity of benefits within programs, the more accurate the analysis. This would imply seeking as fine a disaggregation in the level of analysis as feasible, down to the level of individual capital investment projects or recurrent expenditure items. However, given data and capacity constraints in many countries, this paper argues that meaningful public expenditure analysis can take place first at the level of the particular programs identified below (e.g., primary education, public health, clinical services, major road segments, agricultural research, fertilizer subsidy). These can often provide relatively robust stylized facts—admittedly based upon more disaggregated project-level analysis from within the country or from other countries that may need to be adjusted for scale effects and marginal versus average impacts—that can be used to evaluate allocations across programs.

Consequently, analysis of intersectoral allocations can be informed by intrasectoral analysis. In turn, analyzing intrasectoral allocations entails (i) identifying and assessing major sectoral programs based upon the nature of underlying market failures and their public-private rationales; (ii) comparing the social cost-benefit across programs based upon the outcomes associated with different program expenditures and where feasible, the social valuation of outcomes-expenditure combinations; (iii) comparing the impact of major program expenditures on the poor; and (iv) to the extent feasible, analyzing key capital and recurrent expenditure within programs using the same three criteria above. Intrasectoral analysis can therefore identify programs within sectors that have a legitimate rationale for public expenditures, and alternative combinations of program expenditures and sectoral outcomes. This can then be used to inform intersectoral analysis, or the mix of sectoral expenditures and outcomes that maximize social welfare.

Intrasectoral expenditure analysis in health

By illustrating the application of the above framework to intrasectoral expenditure analysis in health, key programs can first be identified based upon the nature of the underlying market failure. In particular, public health programs can be identified that provide public goods and large externalities (e.g., safe water, sanitation, vector control, control of infectious diseases, some immunizations) as opposed to those that provide private benefits (e.g., curative or clinical services). Within the latter, basic clinical services (e.g., treatment of infection and pain, prenatal and delivery care) can be distinguished from advanced, tertiary care (e.g., specialized intensive care), because of the distinct nature and incidence of benefits they provide. While data on some public health programs (e.g., EPI) are more readily available because they are vertically administered, getting data by health programs can generally be difficult. This is because government budgets typically have line-item rather than program formats; there is joint cost allocation within facilities that deliver each of these programs; and there are weaknesses in data on state and local governments that often provide basic health services. These may necessitate small sample surveys to identify the program mix within different facilities (e.g., large percentage of tertiary health care in urban hospitals), while more comprehensive improvement in data collection is undertaken.

Given program-level expenditures, application of the first criterion above—the relative roles of the public versus the private sectors—would by itself imply a greater priority for public health in view of its public goods characteristics and that the private market will underprovide. By contrast, there is active private sector financing and provision of clinical services and tertiary care in many developing countries. In low-income countries, private out-of-pocket payments account for more than half of the aggregate expenditure on clinical services. In Tanzania and Haiti, NGOs operate nearly half of the hospitals, and in Cameroon and Uganda, they manage 40 percent of health facilities. Public sector provision that substitutes for these services is likely to be less socially beneficial than providing services such as public health, which the private sector cannot provide.

Applying the second criteria—social cost-benefit analysis—first requires identifying the impact of different program expenditures on health sector outcomes. Key health sector outcomes of concern in developing countries typically consist of improved health status, measured for instance by reduced infant and maternal mortality rates. Establishing the relationship between program expenditures and health outcomes is problematic because health outcomes can be a function of many other factors than mere government expenditures. Nevertheless, country studies have attempted to examine this empirically. For instance, econometric analysis of panel data in Malaysia suggested that controlling for other factors (e.g., growth in incomes), public health programs such as immunization rates and safe water supply had the strongest and most significant effects on reducing infant and maternal mortality rates. Further, the analysis reveals that while the total number of doctors improves health status, the number of publicly-employed doctors (through government clinical services) does not improve health outcomes, suggesting that public provision may substitute for private doctors with no net beneficial impact. Such analyses would suggest that if the government seeks to improve health status as measured by infant and maternal mortality, increased allocations for public health programs would be required.

Even given a relationship between program expenditures and outcomes, carrying out cost-benefit analysis of health expenditures poses formidable and for all practical purposes, insurmountable challenges in the short run. A key problem lies in valuing the benefits from improved health. Such an analysis necessitates the analytically and ethically problematic issue of placing a value on life saved. Numerous empirical techniques for calculating the statistical value of life—e.g., through compensating wage differentials in labor market studies or contingent valuation surveys—have been attempted, but they have significant shortcomings. The range of $3 to 7 million for the value of life that emerges from these studies is based upon labor market and survey evidence in developed countries, and even there, it is unclear whether these estimates are convincing or credible. These shortcomings have led to the use of cost-effectiveness as the criterion for choosing among health programs. The World Development Report (WDR) for 1993 used cost per DALY as the criterion, and identified a package of public health and "essential" clinical services as being cost-effective and desirable for public funding. The cost of this package is estimated at $12 per capita for low-income countries as against only $5 to 7 that is actually spent by these countries on these programs. However, the WDR 1993 criterion itself has some important limitations. For instance, cost-effectiveness is not based on any welfare criterion, and therefore makes it difficult to assess net benefits to society. Implementing the WDR norms in Tanzania, for example, would have implied that health spending be increased more than 5 times, thereby squeezing other sectoral expenditures irrespective of any knowledge of their relative benefits. In addition, the WDR recommendation for universal provision of clinical services does not take into account the likely impact and crowding out of private provision. In view of these complexities, the paper concludes that it is difficult to value and compare health benefits. The paper suggests establishing the relationship between program expenditures and health outcomes, and then deciding upon the mix of sectoral expenditures-outcomes using social valuation revealed through the political process as well as through sensitivity analysis with reasonable ranges.

To assess the impact of various health programs on the poor, a number of expenditure-incidence studies have been carried out to identify who receives subsidies from health spending. They conclude that expenditures on public health and basic curative care are more pro-poor, while subsidies at tertiary levels primarily accrue to the rich. For instance, a review of 13 country studies indicates that while 50 percent of the subsidies from public health accrue to the bottom 40 percent of the population, only 29 percent of the subsidies to hospitals benefited them. While the subsidy for public health appears reasonable, it is important to examine the rationale for across-the-board subsidies for curative care as a mechanism for poverty alleviation, given the relatively high income elasticity of 1.5 for health care.

The above stylized facts suggest that among health sector expenditures, public health programs have a more compelling rationale for public expenditures, provide larger benefits for the poor, and more effectively contribute to improved health outcomes. However, public health programs are grossly underfunded by many governments, even though most governments publicly commit themselves to ambitious targets for improved

health status. For instance, while immunization against measles, diphtheria and tetanus has reached 90 percent of the population in some countries such as China, Cuba and Chile, it is still below 50 percent in some Asian and many sub-Saharan African countries. Many of the other key public health programs are also considerably underfunded (e.g., information and prevention of AIDs, safe water). On average, low-income developing countries spend only $1 per capita on public health against an estimated minimum requirement of $4 per capita. Consequently, in many countries, increased allocations towards public health will be efficient and equitable, and contribute to stated targets for reducing infant and maternal mortality rates. Within curative care , governments across developing countries have increasingly pledged themselves to universal provision of basic clinical services, and enhanced cost recovery for tertiary care. However, actual expenditure allocations are often orthogonal to these stated priorities and tertiary care continues to be heavily subsidized because it benefits powerful interest groups such as the urban middle class. For instance, in Jordan and Venezuela, tertiary care absorbs over 70 percent of total spending. Even though universal provision of basic clinical services may not be an appropriate objective in the first place, relative higher allocation for tertiary services at the expense of clinical services would appear to be more inefficient and inequitable. More generally across developing countries, only 25 percent of government spending, and often less, is devoted to public health and primary health care, even though there is significant scope for reducing mortality and morbidity rates through a reallocation of health expenditures towards these services.

Turning to the economic composition of health expenditures, various country studies reveal common patterns of input-mix imbalances, such as the inadequate funding for recurrent costs of continued investments in hospitals and health facilities and the crowding out of non-wage items by wage expenditures. For instance, in Malawi a detailed study using country-specific *r* coefficients (or the ratio of incremental recurrent spending to total investment) estimated that actual recurrent expenditure during the 1980s was only 25 percent of what would be required to service capital investments undertaken during the period. Within recurrent spending as well, there are often imbalances between wage and non-wage expenditures. In many countries, wage expenditures have grown rapidly, while spending on essential drugs and supplies have been grossly inadequate. For instance, in Kenya during 1985-88, personnel expenditures on health grew by 6.4 percent per annum in real terms, while non-wage operating expenditures decreased by 4.4 percent, resulting in shortages of drugs and supplies. In Uganda in the early 1990s, health care workers lacked syringes and gloves even though AIDS was a serious public health problem. Even though the wage bill has crowded out non-wage O&M, salary levels of health care workers have often been found to be too low to provide them incentives to deliver health services efficiently (e.g., Jamaica). In Tanzania, public health care workers are estimated to earn only 50 percent of their private sector counterparts. Furthermore, while many country studies have found aggregate overstaffing in health (as in other sectors), there is often imbalance across programs and facilities, with overstaffing concentrated in urban hospitals and clinics, while there is a shortage of skilled staff to work on public health programs in remote areas (e.g., Mali).

Intrasectoral expenditure analysis in education

In education, different levels and types of instruction— primary, secondary, and tertiary education as well as vocational/technical education—can be taken as the major programs for analysis. They are characterized by different underlying market failures, nature of benefits provided and impact on the poor. Given mounting evidence about the significant externalities from female primary education, this should constitute another important unit of analysis, if corresponding data are available. More generally, compiling program-level data here is somewhat simpler than in health because programs by and large correspond to facilities; however, both share the difficulty of compiling data from lower levels of government.

Applying the first criterion for expenditure choice across these programs suggests that the rationale for government intervention is much more compelling for primary versus tertiary education because of the generally accepted, large social externalities from basic literacy which make the return to society as a whole larger than the return to individuals. Even here, however, public financing and provision needs to build upon and take into

account the active provision of primary education by NGOs in many developing countries. For secondary education, the imperative for government financing or provision should not be taken as given, in view of less compelling evidence on externalities and the significant private sector provision in many developing countries which government provision may potentially crowd out. For instance, over a third of secondary school enrollment in 38 developing countries is accounted for by the private sector. Low school fees for secondary schools, outright prohibition of private schools in some countries as well as excessive regulation of private institutions impedes further private sector response in many countries. Yet, private schools appear to have lower costs and better outcomes in several countries. For instance, evidence from six countries (Colombia, Dominican Republic, the Philippines, Tanzania and Thailand) suggests that holding student characteristics constant, private secondary schools not only have lower unit costs, but also have higher achievement scores. Finally, the rationale for public sector provision of tertiary education and vocational/technical education is questionable. Although there may be some externalities, private returns are high, and can be captured in the private market. Capital market imperfections or equity concerns that might constrain access are likely to be better addressed through other means (e.g., student loan programs, financial sector interventions, or scholarships for the poor).

The second criterion—cost-benefit analysis—has been extensively applied in education based upon wage differentials on account of different levels of education. A comprehensive review of such analyses for 78 countries points to much higher returns for primary and secondary as opposed to tertiary education; further, general education has higher returns than vocational/technical education. For instance, rates of returns for primary education in sub-Saharan Africa and Asia are over 20%—twice the return for tertiary education. However, numerous omitted variables in these studies—most importantly, family background, and quality as opposed to quantity of education—bias the returns. Further, rate of return computations include private benefits (i.e., future wages), at least some of which can conceivably be captured in the private market; instead, these computations should take into account only the additional social benefits, net of the private market equilibrium. The problem is, however, that the literature has not thus far been able to measure the net additional social benefits or externalities.

Regarding expenditure-incidence, numerous studies conclude that expenditures on primary and secondary education are more pro-poor than tertiary education. A review of 13 country studies indicates that on average, only 10 percent of subsidies for higher education went to the poorest 40 percent of the population, while 43 percent of subsidies for "all education" accrued to this income group. In Malaysia, for instance, 36 percent of the subsidies for primary education in 1989 accrued to the bottom 20 percent of the population. These stylized facts suggest that there is a strong rationale for the subsidization of primary education and for enhanced cost-recovery in higher education.

The above stylized facts from international experience suggest that investment in primary education is likely to be more efficient and equitable than investment in secondary education, which in turn is likely to be more efficient and equitable than higher education. Consequently, primary education ought to be a priority for public spending on education in those countries that have low net enrollment at these levels (e.g., below 75 percent). *On average*, developing countries have by now begun to allocate a higher share of public spending on education to primary education (35-45 percent), followed by the secondary (25-35 percent) and tertiary (15-25 percent) levels. However, the levels of subsidization of higher education are still very high in many countries that have yet to achieve anything close to universal enrollment or good quality education at primary levels. The subsidization of higher education is most acute in Africa, where public spending per student in higher education is about 44 times spending per student in primary schools. An extreme case was found in Tanzania with a ratio of 238:1. In Brazil in the early 1990s, university spending per student exceeded $6000 per student (totaling close to $1 billion per year), and was over 25 times spending per primary student, even though Brazil's basic education indicators (including quantity and quality) were among the lowest in Latin America.

Given the priority on primary education, a key issue is the economic composition of program expenditures, or allocation across inputs (teachers, schools, instruction materials) that can best achieve desired educational outcomes (e.g., student achievement and learning). There is considerable research on the education production functions (i.e., the relationship between inputs to educational outcomes of improved learning). For instance, a review of 96 studies of educational production functions in developing countries concludes that the *quality of facilities*, *teacher education* and the *availability of textbooks* are quite important in enhancing learning. However, there is controversy about the extent to which class size, teacher-pupil ratios and teacher experience contribute to improved learning. As against this, there are considerable expenditure imbalances within education in several developing countries. Teacher salaries often absorb the bulk of education expenditures, leaving very little for textbooks or the maintenance of facilities in developing countries. For instance, in Kenya the share of civil service pay and employment escalated during the 1980s while non-wage operations and maintenance declined precipitously, ultimately amounting to less than half the price of a textbook by the early 1990s.

Economic infrastructure and intrasectoral expenditure analysis in roads

Economic infrastructure covers a wide array of services, ranging from public utilities such as power and telecommunications, public works such as roads, and other transport services such as railways and ports. The public sector has traditionally had a dominant role in the financing and delivery of infrastructure services. However, applying the first criteria above would suggest that the nature of market failures and the associated rationale for public expenditures are not compelling any more in some infrastructure subsectors because of new technology and changes in regulatory management of markets. Indeed, as the WDR of 1994 points out, changes in technology in *telecommunications* and *power* have created new scope for competition and private sector participation (e.g., privatization of the telephone system in Mexico and the power system in Chile). Private financing of new infrastructure investments is growing rapidly across developing countries through build-operate-transfer (BOT) arrangements (e.g., power-generating plants in China and the Philippines). While the role of government will undoubtedly remain important in these sectors in the short term, there is likely to be a considerably diminished relative importance of public investment, although this will need to be accompanied by an appropriate regulatory framework to attract private provision and financing.

Applying the framework of expenditure choice to the road sector suggests that major road types or programs can first be identified based upon the nature of the underlying market failure. Rural and uncongested interurban roads are typically nonexcludable as well as nonrival because adding another driver does not reduce the value to someone else. These therefore constitute public goods with a strong rationale for public provision. However, access to some interurban roads can be prevented by making them toll roads (i.e., "club goods", which are excludable but nonrival), which can then in principle be built and operated by the private sector. By contrast, urban roads are congested during peak hours, but until recently it has been difficult to exclude users from urban roads or to charge users different amounts during peak and off-peak periods. New electronic techniques of monitoring road use may ultimately make it technically feasible to treat many urban roads as private goods.

The vast bulk of roads, however, will continue to be public goods in most developing countries, and that therefore brings up the second criteria of cost-benefit analysis for choosing among alternative road investments. Benefit valuation of road expenditures is more straightforward than health or education. These are measured through savings in vehicle operating costs, which in turn can be calculated based on road surface, road condition and average daily traffic. Indeed, there are computer models, such as the Bank's HDM model, which can be used to evaluate rates of return for each road link (i.e., program) in a network, taking into account interlinkages and flow externalities. Indeed, an example from Peru illustrates the power of this approach: economic rates of return were calculated for every road link in the country, and a list of 28 investments, totaling $275 million, were shown to be economically not viable given their unit costs and average daily traffic.

Applying the third criteria—impact on the poor—has proven quite difficult in roads because of their public goods characteristics. It becomes difficult to attribute the indirect benefits of roads across income groups, and benefit-incidence has therefore not been carried out as in health or education. However, some methodologies to measure the impact of road expenditures on the poor are only now being employed in new research on countries such as Vietnam and India.

Looking to the economic composition of expenditures, rates of return on road expenditures have generally shown higher returns to maintain existing road segments than to construct new links. For instance, road maintenance projects supported by The World Bank in recent years had an average return of 45 percent against 24 percent for new construction projects. Inadequate maintenance imposes large recurrent and capital costs. The engineering and physical characteristics of paved roads are such that, as a road begins to deteriorate, lack of routine maintenance will hasten deterioration. Neglect of relatively inexpensive routine maintenance can compound problems so much that the entire surface of a road has to be replaced. Yet, in sub-Saharan Africa, almost $3 billion worth of roads—one-third of those built in the past twenty years—have eroded due to lack of maintenance. In Latin America, for every dollar not spent on maintenance, $3 to $4 are estimated to be required for premature reconstruction.

Intrasectoral expenditure analysis in agriculture: Country example

A country example from India shows how the above framework can be used to analyze intrasectoral expenditures in agriculture for the early 1990s. The main programs identified within the sector include the fertilizer subsidy, crop production schemes, irrigation, agricultural extension, agricultural research and forestry. The fertilizer subsidy and crop production schemes that dominated the central government budget did not meet the first criterion as an appropriate role for the public sector: they were continuing to subsidize "new" inputs and technologies that were introduced 10-20 years ago and that farmers were well aware of. Irrigation turned out to be a more important determinant of fertilizer consumption in the poorer, low-use regions. As such, it was possible to rank the rates of return across irrigation programs and reveal that maintenance as well as support for private groundwater irrigation have much higher returns than new service irrigation, which is not socially profitable. In addition, agricultural extension was found to have very high rates of return but lacked key non-wage O&M allocations which impeded the mobility of extension workers. Finally, agricultural research and some forestry programs were found to have relatively high returns. Consequently, the rationale for public intervention and rates of return were used to rank and prioritize relative allocations across key programs.

Analyzing intersectoral and interprogram allocations

Given intrasectoral expenditure analysis as above, what expenditure allocations across sectors, or intersectoral allocations, will maximize social welfare? The literature has primarily attempted to evaluate intersectoral allocations by examining their relationship with economic growth using evidence from cross-country, time-series regression analysis. But there is a lack of consensus among these studies even about the direction of impact of key expenditure categories (e.g., positive or negative impact of the share of health, education and transport spending). There is also controversy about the often presumed negative impact of defense spending. Indeed, several studies show that defense spending has generally not been associated with lower rates of economic growth. Other studies have attempted to evaluate the impact of the stock of capital (human and physical) and growth. Here, there is consensus on a positive impact of human and physical capital on growth, but uncertainty about its magnitude. A more fundamental problem in relying upon such studies is that they analyze the growth implications of aggregate sectoral expenditures, which consist of very heterogenous expenditure programs. Further, such cross-country studies present evidence about the "average" impact, and it is infeasible to control for the myriad of factors that typically determine marginal returns of particular intersectoral allocations across countries at different points in time.

This conclusion is reinforced if one examines the often presumed negative impact of defense spending. There is much controversy about the positive versus negative impact of defense spending on growth, starting from the work by Benoit. A recent analysis found that there is a quadratic relationship between military spending and growth; defense contributes to growth up to a certain point, beyond which it is detrimental. Further, this depends on neighbors' military spending which is the most important determinant of a country's military spending. This does not imply that defense spending in several countries may not be unproductive; rather, it says that it is difficult to say whether defense spending is always unproductive or even whether there is an across-the-board international norm such as Robert McNamara's 2 percent of GNP cutoff rate. Consequently, a key problem with such cross-country studies is that they present evidence about the "average" impact, and it is infeasible to control for the myriad of factors that typically determine marginal returns of particular intersectoral allocations across countries at different points in time.

This paper suggests that building upon the analysis of intrasectoral expenditure allocations as discussed earlier, the same three criteria be applied to intersectoral allocations, as they were for intrasectoral allocations. Applying the first criteria would imply that there is no compelling rationale for public expenditures in sectors such as *industry*, and more recently even in *telecommunications* and *power*. Even within other sectors such as health and education, the evaluation of intrasectoral expenditures as discussed earlier will imply a reallocation towards programs providing public goods and strong externalities (e.g., public health, primary education) and away from programs where there is little justification for public provision (e.g., tertiary health care, university education). This could also imply fewer resources for programs where there may be some justification for public intervention, but where public provision could substitute for or only marginally improve upon the private sector (e.g., clinical care, secondary education). Retrenchment or reduced allocations of public expenditures away from such sectors and programs would necessitate concomitant reforms in the incentives and regulatory framework to fully elicit efficient private sector response. *This implies that the first step in intersectoral or interprogram allocation should be to channel resources to those programs the private sector cannot undertake, and away from programs that constitute the comparative advantage of the private sector.* These considerations led to significant intersectoral reallocations in countries such as Ethiopia, Lithuania and Estonia during the early 1990s; in Ethiopia, for instance, expenditures were allocated away from industry and agriculture and towards basic social services and infrastructure.

Past this, however, there will still remain the problem of allocating resources among heterogeneous programs that constitute legitimate areas for government intervention with potentially high returns. These could include, for instance, the choice between alternative combinations of interprogram allocations among road maintenance, public health, primary education, agricultural research and extension, and defense. This brings up the second criterion for interprogram expenditure choice—i.e., cost-benefit analysis across these alternative combinations. A key problem is that it is more difficult to compare and value programs across sectors than within sectors. The paper suggests that a three-step analysis be carried out. First, the analysis would need to identify alternative combinations of program allocations and their corresponding outcomes (e.g., infant and maternal mortality, quality and quantity of education, road segments constructed and maintained in particular condition, increase in crop yields, reduction in external threat). Clearly, it is difficult to establish these relationships, but it becomes inescapable to attempt to do so to the extent feasible. It is important for the analysis to take into account interdependencies and externalities between different program expenditures to meet particular outcomes. For instance, there are huge interactions between health and education programs, where, for instance, children's health affects their learning, and mothers' education affects children's nutrition. Consequently, multisectoral or multiprogram expenditures (e.g., girls' education, child nutrition, child health) that best meet particular outcomes (e.g., integrated child development) would need to be taken into account in establishing interprogram expenditures-outcome relationships.

Second, an attempt needs to be made to select those program expenditure-outcome combinations that are most socially desirable. The central problem here, of course, is that it is difficult to measure and compare the

benefits across programs in key sectors. As a starting point, the government's stated objectives or key targeted outcomes could be taken as a starting point, and the results of intrasectoral analysis could be used to identify the allocations across programs that achieve or improve upon these stated objectives. This could reveal for instance that intrasectoral reallocation can improve upon sectoral outcomes even without intersectoral reallocation in favor of that sector. However, the analysis can also reveal that there are insufficient resources to achieve the vector of medium-term outcomes in the government's objective function. Consequently, an attempt will need to be made to evaluate the tradeoffs between alternative combinations of program expenditures-outcome combinations to choose the mix of outcomes that would be most socially desirable. Measuring these benefits is complex and probably infeasible. Nevertheless, sensitivity analyses can be carried out using plausible ranges for values of outcomes from studies elsewhere (e.g., estimates of the value of life from developed countries of $3 to 7 million), and transparent packages of input-outcome choices resulting from alternative interprogram allocations can be presented to policymakers.

Third, where politically feasible, these input-outcome combinations can be subject to voting through the budgeting process, whereby ministers, legislators, interest groups and households will implicitly place social values on alternative bundles of public goods through the voting process and thereby simulate a political, contingent valuation survey.

Some elements of such an intersectoral expenditure analysis exercise were carried out in Uganda by the Government and the World Bank in 1991. The exercise identified and reduced resource allocations for industry, state farms, university education and hospitals. From these savings as well as additional resources accruing from the counterpart funds of donor's balance of payments support, a "surplus" pool for interprogram reallocations was identified. A policy paper identified the various high-priority programs to which these resources could be allocated, together with a depiction of the state of affairs of specific program outcomes (e.g., low enrollment, high mortality and morbidity rates from preventable diseases, poor condition of newly constructed roads, declining crop yields) as compared to stated government targets for these programs (e.g., universal primary education within a decade, public health for all). This also included an assessment of defense expenditures, where spending had been growing rapidly while external and internal threat had in fact diminished. The policy paper was discussed internally within government in order to consider alternative scenarios/iterations and achieve consensus on expenditure priorities during the budget preparation process. The net result of the exercise was that the shares of total expenditures for primary education, public health, road maintenance, and agricultural extension were significantly increased, while the share of agriculture, industry, tertiary social services and defense were reduced. More recently, an ongoing exercise in Guinea attempts to estimate the cost of the government's stated targets for primary education, public health and road maintenance to show that this will imply considerable reallocation of resources towards these programs over a three-year period.

The impact on the poor must be an integral and central element in the program expenditure-outcome combinations referred to above. Indeed, it is important to explicitly evaluate the impact of interprogram allocations on the poor to identify those that meet the poverty alleviation objectives most cost-effectively. To reach the poor, it is important to target expenditure programs that matter the most to the poor. As already mentioned, benefit incidence analyses show that spending on primary education and public health generally reaches the poor. This enhances the human capital of the poor, and reduces their current and future poverty. However, there is less empirical evidence available about the relative direct or indirect impact of physical infrastructure on the poor, although ongoing research should help inform this issue. Theory and cross-country evidence shows that across-the-board subsidies for food, housing, universities and hospitals are inappropriate not only on efficiency criteria as mentioned above, but are also on account of their poor cost-effectiveness for poverty alleviation, given their leakages to the rich. However, programs that attempt to exclusively target the poor (e.g., food stamps, employment guarantee schemes) may or may not have a greater impact on poverty alleviation, than alternative uses of the same budget. That will depend upon the design and costs of targeting. In poor countries, self-targeting often works better than means-testing. Self-targeted programs, such as programs

targeting inferior goods (e.g., lower quality food products in Tunisia and cassava in Indonesia), have indeed succeeded in cost-effectively reaching the poor. However, targeting involves costs not typically taken into account—e.g., administrative costs, participation or opportunity costs of the poor, and other behavioral responses, such as reduction in private transfers. Indeed, a recent review concludes that while targeting often better concentrates benefits on the poor than universal programs, it will not necessarily have a greater impact on the poor once the extra costs have been factored in. For instance, an analysis of the public employment scheme in Maharashtra (India) finds that once the foregone incomes of the participating poor as well as the administrative costs have been factored in, the scheme entails a net transfer of only half the budget and the same outlay uniformly transferred to all households may have made no less of a dent on income poverty.

Consequently, targeting should be seen as a potential instrument, not an objective. In general in many developing countries where poverty is widespread and administrative capacity low, some combination of broad targeting, or universal provision, of basic services (e.g., public health and primary education) together with some narrow targeting of particular programs exclusively to the poor will be required to reach the poor through public expenditure policies.

Analyzing the economic composition within and across sectors

The discussion above has provided a framework for analyzing the functional composition of expenditures, which includes analyzing the input-mix imbalances or the economic composition within and across sectors. Typically, important input-mix imbalances in the economic composition emerge within and across sectors and programs that need to be analyzed and redressed. The economic composition includes (i) capital investments, and (ii) current or recurrent expenditures, which include wages and salaries, other goods and services (including non-wage operations and maintenance, or O&M), interest payments and subsidies. There are often patterns of under- and overspending for each of these categories which cut across sectors or functional categories in many developing countries. These include the bias toward new capital investments, the underfunding of non-wage O&M, overstaffing of a poorly paid civil service. To correct these problems, it is essential to undertake *an integrated analysis of the economic composition*—capital/recurrent and wage/non-wage balances—within each major program. This involves (i) compiling data on the economic composition of major programs; (ii) weeding out unproductive programs using the criteria as discussed earlier; and (iii) examining the capital/recurrent and wage/non-wage balance within each program. This proposed approach constitutes a major departure from the capital-led budgeting and fragmented analysis of the economic composition that is actually carried in many countries, as further explained below.

Capital investments are typically grouped under the Public Investment Program (PIP). In many developing countries, the PIP has consisted largely of donor-financed projects. Projects were typically conceived, designed, and appraised by donors themselves. The evaluation of public expenditures in the 1970s and 1980s took the form of Public Investment Reviews (PIRs), and focused exclusively on the evaluation of the PIP. These PIRs primarily sought to derive an aggregate ceiling for public investments based upon an ICOR-driven model of the economy, and select projects within this ceiling based on a ranking of economic rates of return. There were, however, a number of limitations in this approach to evaluating capital investments. A principal weakness of this approach was that it led to donor-driven, capital-led budgeting. Individual capital investments were funded while their consistency with larger sectoral priorities were ignored, recurrent costs of existing investments were grossly under-funded, and the significant recurrent cost implications of a growing investment program were not taken into account. Furthermore, it was impossible to evaluate more than a small percentage of projects because of capacity constraints and considerable analytical as well as empirical difficulties in valuing benefits in key sectors.

In light of these shortcomings, the paper proposes that a more integrated approach to capital budgeting be undertaken. *First*, the list of capital investments within each key sector and program needs to be compiled. This may necessitate reconciliation of and integration between the PIP and the development budget. For instance, in Uganda, the development budget was only a quarter of the PIP, and often did not include many major projects. *Second*, capital investments need to be aggregated within major programs, and program-level analysis as discussed above undertaken to weed out capital (and recurrent) expenditures for programs of dubious economic viability. For instance, PIRs in Indonesia in 1985 and in Egypt in 1991 used such an aggregation to analyze and recommend substantial reallocations of planned public investments for major programs within and across sectors. A review of the role of government versus the private sector led to a significant shift in the PIP from manufacturing to infrastructure in Pakistan and Turkey during the 1980s. More recently in Central and Eastern Europe (e.g., Poland, Latvia, Estonia), this has helped screen out large numbers of investment projects of a commercial nature (e.g., cement factories, steel mills) inherited from the central planning era. *Third*, the bias in favor of capital investments needs to be analyzed and redressed by undertaking an integrated analysis of capital versus recurrent expenditures within major programs. This entails assessing whether the typically higher-return non-wage O&M costs of existing investments within the sector/program are adequately funded, and by estimating the recurrent cost implications of new capital investments. For instance, in Mali and Ghana the computation of recurrent costs of the PIP using *r* coefficients (i.e., the ratio of incremental recurrent costs to total investments) helped demonstrate the unstainability of the investment program in the medium term. Preliminary analysis in Guinea suggests that the "recurrent cost" gap could be as much as a quarter of total requirements by the year 2000. *Fourth*, only major projects within key programs should be subject to rigorous economic evaluation, especially to identify large, capital-intensive "white elephants." Here, cost-benefit analysis has been useful in weeding out or deferring major projects, such as the deferment of investment in new railways in Costa Rica, and the postponement of a four-lane divided highway in Côte d'Ivoire.

The evaluation of *civil service wages and salaries* entails examining three key dimensions: the total wage bill, civil service employment, and civil service pay, including average pay and the structure of pay scales. Some general assessment of whether the *wage bill* is excessive is typically based on broad indicators such as trends or international comparisons in the ratio of personnel expenditures to total revenues or GDP. While these can point to egregious anomalies, a more meaningful assessment requires examining whether there is underlying, excessive public employment or pay scales. Whether there is *excessive or surplus civil service employment* ultimately depends upon the appropriate role of government within and across sectors. This involves identifying the major programs where civil servants are employed, evaluating whether government spending on these programs is justified, and assessing the appropriateness of the wage/non-wage balance within these programs. To undertake such an analysis, a key challenge in many developing countries is to get accurate data on the growth and breakdown of employment. Indeed, the most obvious manifestation of excessive employment is the existence of "ghost" workers, which can be identified through a proper accounting of civil service employment with payroll lists and the Employment Register. In Uganda, for instance, such an exercise revealed not only large numbers of "ghost" teachers but entire "ghost" schools! Another manifestation of overstaffing is the significant employment of civil servants in programs of dubious economic justification. Indeed, with data on civil service employment by sector and program, program-level evaluation as discussed earlier may reveal that the bulk of employment is in programs that can be eliminated or privatized (e.g., state farms in Uganda). The so-called functional review of ministerial portfolios in several countries (e.g., the Gambia) seeks to identify surplus employment in specific areas, although not necessarily through an economic evaluation of programs within ministries. Within economically viable programs, the growth of public employment over time can be analyzed to identify whether civil service employment was related to the expansion in scale of appropriate service provision. In many countries during the 1960s and 1970s (e.g., Tanzania and Kenya), the government became the employer of last resort, and civil service employment expanded across the board, quite unrelated to any commensurate increase in the quality or quantity of service delivery. One particular area within programs where such growth has occurred in several countries pertains to daily paid staff, who are typically hired outside the scrutiny of the Establishment Register. A final, key analysis of whether there is overstaffing within programs

would depend upon whether critical, complementary non-wage O&M expenditures (e.g., textbooks per student, supplies, drugs and syringes in health programs) are grossly inadequate and underfunded, as further discussed below.

Turning to *civil service pay scales*, these are typically determined centrally, and therefore, cut across sectors and programs. The patterns observed are the decline in average pay, a proliferation of non-wage allowances, and a compression of the wage structure (e.g., Tanzania, Guinea, the Gambia, Ghana). Pay scale information is easily available through budget documents, and through this, compression ratios and their trends over time can be computed. Using information on employment by salary grade, alternative scenarios of salary decompression can be projected and analyzed (e.g., Tanzania). In evaluating civil service pay, it is critical to take into account nonmonetary allowances, the data for which may not be readily available and may require compilation through interviews. With this, trends in total civil service compensation over time as well as private sector comparators can be analyzed. The above analyses can help identify actions for the reform of civil service pay and employment, which is central and vital for the efficiency and effectiveness of public spending. Reforms have typically focused on (i) reducing employment through reducing ghost workers, voluntary and early retirement, freeze on new hirings, and retrenchment based on functional reviews or program-level evaluation; and (ii) using the savings from retrenchment to decompress salary scales, incorporate allowances into monetary pay, and raise real pay over time.

The evaluation of *non-wage O&M* is a vital and integral element of the evaluation of the economic composition within major programs. A range of country experiences strongly indicates a reduction in these expenditures, a worsening of the wage/non-wage balance, and a marked deterioration in infrastructure and services, such as schools without teaching materials, clinics without drugs, and rehabilitated roads becoming impassable once again. For instance, in Kenya the share of civil service pay and employment escalated during the 1980s while non-wage O&M declined precipitously, ultimately amounting to less than half the price of a textbook per student; in Costa Rica, non-wage O&M dropped by 80 percent during the 1980s, resulting in poor or very poor condition of that national road network; in Indonesia irrigation infrastructure deteriorated during the 1970s and early 1980s on account of inadequate O&M. This is unfortunate, given that O&M expenditures often have very high rates of return (e.g., returns of about 100 percent from irrigation maintenance in Indonesia in the mid-1980s). A recent World Bank study estimates that $40-45 billion will need to be spent on road repairs in sub-Saharan Africa, when $12 billion would have sufficed to maintain the roads. In order to restore O&M funding to more realistic levels, a set of techniques known as standard cost analysis have been used in a number of countries (e.g., Ghana, Kenya and Tanzania) for calculating expenditure norms. The basis for this analysis is information on costs related to the activities undertaken. The deterioration of budgeting and accounting systems in most countries has necessitated that a separate exercise be launched to calculate and update norms for non-wage O&M on a sustained basis. However, in evaluating O&M norms, it is important to note that norms are related to a certain level of service delivery—i.e., an input-output combination producing outcomes whose net social benefits should be subject to scrutiny. This, in turn, should be based upon program-level evaluation of the inputs (e.g., textbooks) required to accomplish socially desirable outcomes (e.g., improved test achievement scores). For instance, estimation of the O&M norm versus actual expenditure in Uganda implied a seven-fold increase to improve the quality of primary education, even though the norm itself was quite modest at only one textbook per subject per pupil. Experience with O&M norms in Ghana has been mixed. On the one hand, given poor accounting systems there were problems in ascertaining whether what was actually allocated was spent, and there have been complaints that the selective application of norms in three sectors has left other priority programs at a disadvantage; on the other hand, the norms have helped make more rational and adequate allocations for O&M in the three sectors.

As with other categories in the economic composition, it is inappropriate to evaluate *subsidies and transfers* as an aggregate expenditure category. There are many different types of subsidies and transfers with distinct public-private rationale, net benefit and impact on the poor. Consequently, the economic evaluation of each type of subsidy and transfer needs to be carried out separately. The methodological issues in analyzing the

efficiency and equity of across-the-board subsidies or broad targeting (e.g., for basic social services), as opposed to narrow targeting were summarized above. Within transfers, the analysis of intergovernmental fiscal transfers constitutes a complex area in its own right that is not within the scope of this paper. Intergovernmental transfers are necessitated where expenditure responsibilities for local public goods and services are assigned to lower levels of government, while the bulk of revenues are collected by the central government, thereby necessitating transfers. The literature on intergovernmental fiscal relations provides guidance about the design of transfers to accomplish specific efficiency and equity objectives. For instance, general non-matching transfers are required to deal with a fiscal gap; general non-matching equalization transfers are needed to address horizontal fiscal imbalances; and conditional non-matching transfers are required to ensure minimum standards of services across the nation. This literature also concludes that the structure of intergovernmental transfers is often inappropriate in many countries, ignoring these general principles. For instance, developing countries have numerous specific-purpose grants for which objectives are either not specified or specified vaguely. The literature concludes that simply fine-tuning the existing structure of grants can yield major economic gains, without reassigning expenditure and taxing responsibilities.

A data framework for public expenditure analysis

Consistent with the methodological framework for public expenditure analysis as presented above, the paper identifies elements of a basic data framework to help carry out such analyses. This can also help identify key areas where improved data needs to be collected. To assist in this process, a set of standardized tables listing basic data requirements is provided in the paper.

To begin with, data on overall budgetary operations are needed to facilitate the analysis of the consolidated deficit and aggregate spending. This includes budgetary aggregates for general government, including state and local governments, as well as extrabudgetary funds. For the analysis of the functional composition, data on expenditure allocations within and across sectors are needed. A key requirement is to compile data by major programs within sectors and their corresponding outcomes or sectoral indicators. Data on the economic composition of expenditures are needed both within and across sectors to identify imbalances in the recurrent/capital and wage/non-wage mix. This includes capital investment expenditures, non-wage O&M as well as civil service pay and employment, broken down by programs. In addition, data on private sector provision, unit costs and outcomes are needed to help analyze the size and performance of the private sector. Further, some of the basic data required for the computation of the benefit-incidence of expenditure programs are also identified. Typically, this will require household surveys which identify the access to key public and private services by income groups, as well as public expenditures on these services. Improving the data base on these key dimensions to facilitate decisionmaking is an important task, although it will undoubtedly require time and corresponding investments in information systems. Some countries (e.g., Colombia, Jamaica) are according high priority to such an endeavor.

Analyzing institutional arrangements in the public expenditure management system

Thus far, the focus has been entirely on the economic analysis of public expenditure allocations. The institutional context has not been incorporated in the analysis. However, to improve public expenditure allocations, it is important to evaluate both the institutional arrangements—or rules of the game among key decisionmakers who allocate public spending—as well as the particular allocations themselves. Indeed, a principal implication of the discussion in the preceding sections is that numerous analytical and empirical complexities constrain the analysis of broad allocations of public spending. In this context, it becomes even more important to evaluate underlying institutional processes and incentives, and support institutional reform to improve expenditure allocations on a sustained basis. This is akin to ensuring that the broader "policy environment" which determines expenditure

allocations is appropriate, rather than evaluating the desirability of individual expenditure allocations themselves. Unfortunately, World Bank PERs have traditionally placed grossly insufficient emphasis on institutional issues. However, recent PERs (e.g., Malawi, Namibia, Guinea, Nigeria) are redressing these shortcomings, and placing emphasis on identifying weaknesses in government budgeting systems and institutional arrangements that impede the achievement of better expenditure outcomes. These newer breed of PERs emphasize government involvement and ownership, with the goal of having the PERs undertaken by the government itself as an integral part of its public expenditure planning and budgeting system. A notable example comes from Ghana, where after a series of Bank PERs the two most recent PERs have been produced by the Government itself.

If PERs must increasingly focus on strengthening government budgeting systems, there is a need for a framework that permits the identification and analysis of institutional arrangements that contribute to improved expenditure outcomes. Unfortunately though understandably, there is a paucity of literature that can provide a cogent framework as well as supporting evidence. A Public Expenditure Management Handbook is being jointly produced by the Bank and the Fund to provide lessons from operational experience on a range of management issues. In this context, this paper presents a framework for analyzing institutional arrangements in the budgeting system based upon research currently underway by Pradhan and Campos (forthcoming), illustrated by some country examples.

Framework for diagnosing institutional arrangements

The analytical framework seeks to identify formal and informal rules in a country's public expenditure management system that influence or contribute to a vector of three key expenditure outcomes: (I) aggregate fiscal discipline, or control of aggregate budget deficits and expenditures; (ii) the prioritization or composition of this aggregate spending among sectors, programs and projects to maximize social welfare; and (iii) technical efficiency in the use of resources. Public expenditure management is characterized by four distinct but related theoretical problems that can impede the achievement of desirable outcomes along these three dimensions. Institutional arrangements can help redress these problems to some extent, and thereby improve expenditure allocations.

The *first* problem has to do with what is known as the tragedy of the commons. Disparate claimants on government spending—line ministries, politicians, donors—view the budget as a common resource pool which they can dip into with little or no cost. The tragedy of the commons problem can be mitigated by basing the budget on a consistent and binding medium-term macroeconomic framework, articulation of a medium-term vision to build consensus about future benefits from current sacrifices, granting the central ministries a dominant position on decisions concerning aggregate spending, and by establishing formal constraints on spending and borrowing. While such rules may exist on paper, a key issue is whether they are binding. This requires institutional arrangements that make fiscal indiscipline transparent and hold the government accountable, making it costly to misbehave. Institutional mechanisms that can facilitate this include mandates for a reconciliation between *ex ante* and *ex post* outcomes (i.e., budgeted versus actual spending and deficits), sanctions for nonachievement of targets, and publishing these as well as making them public. In addition, openness of financial markets can transmit the costs of fiscal indiscipline to constituencies while making it costly to distribute rents.

The *second* is a problem of information asymmetries and high transactions costs which may impede an efficient mapping of expenditures by government with the preferences of individual and groups in civil society which constitute its power base. Institutional arrangements that can help reduce these transactions costs to better facilitate expenditure-preference mapping include (I) mechanisms to reveal demand of civil society about the preferred mix of outcomes or budgetary priorities (e.g., parliamentary discussions and oversight); (ii) mechanisms to build consensus among claimants about relative allocations; and (iii) transparency about the process of making budgetary allocations (including proposed allocations and their outcomes) as well as about the actual allocations and their outcomes in an accessible and timely manner; and (iv) mechanisms to penalize or reward the

government for the expenditure allocations that are made. The decentralization of some expenditure decisionmaking to local levels of government, who are generally accepted to possess better information about local preferences, could constitute another institutional arrangement to potentially improve the expenditure-preference mapping. However, whether local governments in fact act in this manner will depend upon whether they are held accountable for results, which in turn will be a function of the transparency of budget allocations and corresponding outcomes, whether local governments have sufficient capacity for detailed expenditure decisionmaking, and accountability of local politicians. In addition, given vertical and horizontal imbalances in decentralized structures, the design of intergovernmental fiscal transfers will determine the incentives for local governments to allocate resources efficiently and equitably.

The *third* problem arises from information asymmetry and incentive incompatibility within the government hierarchy (e.g., the relationship between the central and line ministries) which can impede a socially desirable allocation and use of budgeted resources. In particular, the central ministries have to balance the macroeconomic constraints with allowing more flexibility by line ministries to capitalize on the latter's superior information for making disaggregated expenditure allocations. A medium-term expenditure framework (MTEF) can constitute an institutional mechanism to achieve this. An MTEF could provide line ministries with resource allocations within the aggregate resource envelope based upon strategic priorities, and then have them articulate the sectoral objectives, programs and unit costs for achieving sectoral outcomes within their resource envelope. At the same time, for this to yield desired results, line ministries need to have incentives to allocate resources cost-effectively, and departments and agencies will need to have incentives to use resources in a technically efficient manner. Line ministries, departments and agencies therefore need to be held accountable for the allocation and use of budgeted resources. Mechanisms for accountability would include financial accountability and audits, value for money audits, *ex post* evaluations, performance-based contracts of chief executives, etc.

The *fourth* problem arises from perverse incentives that may stem from external, donor assistance in aid-dependent developing economies. Line ministries are interested in donor projects as it alleviates their hard budget constraint. Since they do not bear the cost of this financing, they will accept the projects whether or not it fits within the sectoral strategy, if in fact there is one to begin with. The extent to which donors' project financing will be socially desirable will be a function of the extent to which it is based upon accurate information about social preferences and the extent to which there is donor coordination to support a mutually consistent composition of expenditures. In actual practice, donor assistance has been fragmented. Further, donor financing of particular types of expenditures has biased expenditure composition in these directions. In particular, donors have traditionally financed capital investments and line ministries have accepted them irrespective of whether existing investments receive adequate resources or whether the new investments can be appropriately maintained in the future. These perverse incentives have become institutionalized in the dual budget system that donors have supported. Donors have supported the public investment program or PIP which has been inherently expansionary, as it has continued to finance an expanding government without concern for whether resources are there to finance existing or new investments. Over time, the concern about the insufficient funding for recurrent expenditures has led to the PIP budget effectively becoming merely an aid budget, with donors financing both recurrent and capital investments. But this has mitigated incentives for line ministries to themselves finance the recurrent budget. To ensure technical efficiency, donors have set up their own project-based enclaves of accountability with their own systems of financial accountability, procurement and auditing.. However, the government's own systems for accountability have typically not been a central focus of donor assistance.

To redress the perverse incentives from donor assistance, institutional mechanisms that can improve expenditure prioritization and technical efficiency include enhancing government capacity and incentives to set up its own strategic priorities based upon the expenditure-preference mapping, coordinated donor review and financing of a slice of government expenditures in an integrated manner without biasing expenditures towards one or the other, and improving accountability in the government's expenditure management system to achieve technically efficient results.

The institutional mechanisms that have been identified above to address key problems characterize an ideal public expenditure management system. It must be emphasized that such a system requires certain *preconditions*. Where such conditions are only weakly present then some of the mechanisms may not be feasibly established. One precondition is a strong adherence of society to the rule of law. Where the rule of law is weak, rules are not likely to be effective no matter how well written and internally consistent they are. A related precondition is the freedom of the press. Publication of budget documents for public scrutiny and the results of surveys are biting only if the press is free to scrutinize them and raise questions about potential anomalies. But the press must also be responsible, i.e., be able to support with evidence whatever it publishes. Otherwise its credibility is strained, which would lower the cost of agency malperformance. And finally, an often overlooked requirement is human capabilities. Some mechanisms require the use of highly skilled individuals to make things work, e.g., auditing, accounting, or cost-benefit analysis. An insufficient supply is likely to create bottlenecks in the system. In effect, weaknesses in any of these conditions would be reflected in deficiencies in the public expenditure management system which the country may not be capable of addressing at the current time. Care must be taken then not to recommend improvements in the system without first looking at the preconditions.

Key questions for diagnosing institutional arrangements

This framework can identify key questions to help diagnose the institutional features that will influence the aggregate level of spending, the prioritization or composition of spending and the technical efficiency in the use of budgeted resources. These include not only the formal and informal rules which ought to be examined, but also the accountability and transparency features associated with these rules which make them binding or ineffective. The paper presents a preliminary questionnaire that can be used to structure this diagnosis.

To identify whether there are rules or institutional arrangements to address the tragedy of the commons problem above and thereby enforce *aggregate fiscal discipline*, key questions would include (i) whether the budget is prepared based upon a macroeconomic framework; (ii) whether there exist formal constraints—constitutional (e.g., Indonesia) or donor conditionality (e.g., Ghana, Uganda)—on aggregate spending, deficits or borrowing; (iii) whether the central ministries have dominance in enforcing aggregate expenditure ceilings in budget preparation and execution, as measured by the percent deviation between their proposals on the one hand, and actual budgetary submissions and expenditures on the other (e.g., Thailand); and (iv) whether there are limits on overspending by individual line ministries. While such rules may exist on paper, a key issue is whether they are binding. This requires assessing whether there is a reconciliation between *ex ante* and *ex post* outcomes (e.g., budgeted versus actual spending and deficits), whether there are sanctions to nonachievement of targets, and whether these are published and made public. An example of such a binding arrangement is New Zealand's Fiscal Responsibility Act which has legislative mandates for full and frequent fiscal disclosure. Preliminary evidence from cross-country, time-series data also suggests that openness of financial markets enhances fiscal discipline by making it costly for governments to overspend.

For *expenditure prioritization*, three main categories of questions can be identified to assess whether formal and informal rules are conducive to producing expenditure allocations that maximize social welfare. The first set of questions concerns the breadth of consultations and transparency with which actual budgetary priorities are established. In particular, are expenditure priorities primarily determined by the central ministries, the Cabinet, donors, or parliament, as measured by the percent deviation in expenditure composition made by these players during the budget cycle? Once again, formal rules about budget preparation can be deceptive, if in fact the budget is actually remade arbitrarily during the year. For instance, in several sub-Saharan African countries (e.g., Ghana), overoptimism in initial revenue estimates result in drastic cuts during budget implementation made in an *ad hoc* manner by the Ministry of Finance and the Controller and Accountant General, with the result that the actual expenditures look nothing like the original budget. Worse, given considerable lags in financial reporting and auditing, no one really knows what actual expenditures really look like within a meaningful time frame. Consequently, a key question to ask is what are the rules and consultations governing

the resetting of priorities during budget implementation, what are the percent deviation between budgeted and actual expenditure composition, whether these are published and made public within a meaningful time frame, and whether there are sanctions against large deviations.

The second set of questions determines the basis on which expenditure priorities are based, and how macro versus micro tensions are resolved between the central and line ministries in making budgetary allocations. Within this, a key question is whether there is a medium-term expenditure planning process (e.g., Uganda), which projects the medium-term macroeconomic framework and allocates expenditures to sectors and programs based upon strategic priorities. Even if this exists, it needs to be ascertained on what basis relative allocations are made. In particular, is there a system of forward estimates (e.g., Australia, ongoing reforms in Malawi) whereby line ministries articulate sectoral objectives, identify the appropriate role of government, and estimate the costs of achieving these objectives or outcomes. To see if such prioritization rules are binding, it would need to be assessed whether there is *ex post* reconciliation of expenditure allocations vis-a-vis budgeted priorities, whether there is *ex post* evaluation (e.g., Australia, ongoing reforms in Colombia) to ascertain whether intended outcomes were achieved, whether there are sanctions against nonachievement of outcomes, and whether these are published and made public.

The third set of questions pertains to the extent to which expenditure prioritization is donor-driven, and if so, what the incentives are towards particular types of expenditures. This requires identifying the percent of total public expenditures that are donor-financed, and the percent of donor projects that finance particular types of expenditures (e.g., capital investments) as opposed to financing a slice of the government's expenditure program. In addition, donor conditionality pertaining to expenditure composition needs to be identified. Finally, mechanisms for donor coordination in the financing of sectoral and intersectoral programs needs to be identified. In some countries (e.g., Malawi), lead donors have been identified for particular sectors that have the responsibility for coordinating donor assistance. In other countries (e.g., Ghana), donors are undertaking sector investment programs (SIPs) in which coordinated donor assistance finances a time slice of the government's sectoral investment budget, preceded by a sectoral or overall public expenditure review.

For *technical efficiency*, a key issue is the adequacy of civil service wages and salaries, as measured by the public-private pay differential at various levels. As already discussed earlier, civil service pay is so low in many countries that civil servants do not have the incentives to perform (e.g., Uganda, Malawi, Ghana). Consequently, motivation and morale is low, and moonlighting is prevalent, leading to gross inefficiencies in service delivery. More broadly, technical efficiency will depend upon the autonomy and accountability of line agencies in service delivery. Relative autonomy would depend upon how much flexibility line agencies have in allocating their resources, including the ability to hire and fire. Key questions on accountability would be ascertaining whether there are financial accounts, financial audits, performance audits, and client surveys. If so, with what frequency and lags, and what have been the typical sanctions for nonperformance. Other features influencing accountability are whether the tenure of the chief executives of line agencies is permanent or fixed-term, and if the latter, whether it is linked to performance. Finally, accountability would be facilitated by the extent to which clients have a voice (e.g., though published client surveys), and options for exit through competition from private or public sector entities. New Zealand offers the most radical illustration of institutional reform to enhance technical efficiency, where conglomerate ministries have been broken up into focused business units, commercial activities have been privatized throughout the public sector, contestability and competition in service delivery has been introduced to the extent feasible in the remaining core public sector, permanent secretaries of line agencies have been replaced by fixed-term chief executives, their performance contracts as well as budgetary appropriations have been explicitly linked to outputs, and they have been accorded autonomy to allocate inputs or expenditures to achieve these outputs.

In sum, while analyzing the broad allocations of public spending, it is equally if not more critical to analyze the underlying institutional arrangements and support institutional reform that can improve expenditure allocations on a sustained basis.

1

PUBLIC EXPENDITURE ANALYSIS: MOTIVATION AND PRESENT PRACTICE

In recent years, a confluence of factors has focused attention on the allocation of public expenditures. Macroeconomic imbalances in developing countries have underscored the imperative to cut aggregate spending and deficits. At the same time, governments have had to make difficult choices about where to cut spending or how to allocate scarce resources to achieve the government's growth and poverty alleviation objectives. Donors, too, have placed primacy on fiscal austerity and economic stabilization in the adjustment programs they have supported during the 1980s and 1990s. They have realized that the earlier focus of their lending for individual projects ignored larger spending priorities. Consequently, donor conditionality in adjustment loans has increasingly focused upon restructuring public expenditure priorities. The World Bank has been devoting substantial resources to carrying out Public Expenditure Reviews (PERs), which aim to analyze the allocation of spending in client countries. However, there is no systematic framework or methodology for carrying out such analysis, and there is little guidance from the academic literature on the subject.

This paper presents a framework for analyzing the level and composition of public expenditures. It applies this framework to analyzing intrasectoral allocations within key sectors (e.g., health, education, infrastructure, agriculture), intersectoral allocations across sectors (including defense), as well as allocations for major cross-sectoral expenditure categories (e.g., the public investment program, the wage bill, operations and maintenance). The objective is to show how an overall framework for expenditure analysis can be applied to analyzing broad allocations within and across sectors, drawing upon some key findings, stylized facts and country examples from major sectors. *Since the approach is illustrative, the paper does not intend or pretend to provide any comprehensive insights on the key sectors or to do justice to the vast literature on each sector.* Although the principal focus of the paper is on allocational issues, it also highlights the critical importance of underlying institutional processes that determine these expenditure allocations and their outcomes. Consequently, the paper concludes by presenting a framework and an associated methodology for analyzing the underlying budgetary institutions, illustrated once again by some country examples.

There exists of course a vast literature on many aspects of public expenditure analysis. This includes the literature on project evaluation, as well as a plethora of research on sector-specific issues. However, there is very little to guide policy analysts in the analysis of the overall level and composition of public expenditures, taking into account the limitations of data and capacity in many developing countries. The IMF's Public Expenditure Handbook (Chu and Hemming 1991) and its more recent paper on "Unproductive Public Expenditures" (IMF 1995) constitute among the very few attempts in this area. The approach and thrust of the present paper differs in two important aspects from these other documents. First, it attempts to present a systematic methodological framework that is applied to analyzing expenditure allocations within and across sectors. Second, the approach and framework of this paper are firmly situated within the broader paradigm of Welfare Economics in the sense that public expenditures are analyzed based upon their contribution to social welfare, relative to the outcome of the private market. Consequently, there is a central emphasis on assessing whether government intervention in general and public expenditures in particular will enhance efficiency and/or equity relative to the private sector.

Organization of paper

This paper is organized in seven chapters. Chapter 2 provides a framework for evaluating public spending. It discusses the macroeconomic framework and the aggregate level of spending, but then focuses on presenting a methodological framework for analyzing the functional and economic composition of spending. It also summarizes key issues in analyzing capital investments, civil service pay and employment, and non-wage operations and maintenance. Chapters 3 and 4 apply this framework to intrasectoral expenditure analysis in health and education respectively. Chapter 5 illustrates the application of the framework to economic infrastructure (principally roads) and agriculture through some examples. Chapter 6 discusses intersectoral expenditure allocations. Finally, Chapter 7 presents a framework for analyzing institutional arrangements in the budgeting system.

Public expenditure reviews in The World Bank

The World Bank has taken on a pioneering role in the analysis of public expenditure composition through Public Expenditure Reviews (PERs). This has been necessitated in large part because the Bank has had a leadership role as development financier, and Bank loans directly or indirectly support the composition of the budget. PERs aim to carry out extensive analyses of the public investment and expenditure programs of the Bank's borrowers. Their main purpose is to make recommendations to governments on the composition (and to some extent, size, though this usually falls in the domain of the IMF) of public spending.

Number and costs of Bank PERs

The Bank has been carrying out a substantial and increasing number of PERs in recent years, and has been investing considerable resources in such work. As Table 1.1 shows, the Bank has been carrying out an average of about 18 PERs every year during 1990-93. This represents a 50 percent increase from an average of 12 PERs carried out per year during 1986-89 (de Melo 1988). Of the total 155 PERs undertaken by the Bank between 1957-93, 45 percent were carried out in the Africa region, followed by 25 percent in the Latin American and Caribbean region (Table 1.2). Indeed, the Africa region has started to place an even stronger emphasis on PERs of late. In 1995, 10 PERs were carried out in the Africa region, and the number is slated to double to 20 in 1996! The region has begun to shift to annual PERs in several countries, which are more focused on specific topics and increasingly produce shorter notes rather than large, omnibus reports.

A survey of all PERs carried out in 1992 revealed that on average, 88 staff weeks were spent on each, with a total average cost of $250,000. One PER for a major client country that carried out detailed reviews in each sector cost $750,000 and 290 staff weeks! However, the cost of PERs has begun to come down in recent years, as country departments are shifting to more focused, annual reviews.

Assessment of present practice

Given the emphasis placed on PERs, what is the practice of public expenditure analysis used in these PERs? Do these provide a sufficient, appropriate framework for evaluating broad allocations? To answer these questions, a random sample of 13 recent PERs was reviewed. For each of these PERs, we reviewed the coverage of sectors and issues, as well as the analytical methods employed.

Table 1.1: Bank Reports on Public Expenditure Reviews by Year, 1957-93

Year	*Expenditure review*	*Investment review*	*Total*
1993	16	2	18
1992	15	1	16
1991	13	3	16
1990	13	7	20
1989	17	1	18
1988	3	3	6
1987	10	5	15
1986	10	2	12
1985	6	7	13
1984	4	1	5
1983	3	3	6
1982	1	0	1
1981	0	1	1
1980	0	1	1
1975-79	1	2	3
1970-74	0	0	0
1957-70	0	3	3

Source: World Bank Internal Document Unit, IDR.

Table 1.2: Bank Reports on Public Expenditure Reviews by Regions, 1957-93

Region	*Number*	*Percent of total*
East Asia	4	9
South Asia	9	6
Sub-Saharan Africa	68	46
Latin America and Caribbean	38	25
Middle East & North Africa	21	14

Source: World Bank Internal Document Unit, IDR.

The review revealed that the coverage of sectors and issues in PERs has been reasonably comprehensive, but the quality of the analysis has been uneven and in many instances, unsatisfactory. Table 1.3 shows the coverage of sample PERs. Among the positive features, about 85 percent of the PERs had a macroeconomic framework. In addition, all PERs reviewed focused on key sectors of health and education, and most examined infrastructure, capital investments and civil service issues as well. However, only half described the budgetary management system, and few discussed intersectoral allocation issues. More worrisome, the analytical approaches in these sample PERs were found lacking in many important respects (Table 1.4), and need to be redressed in the future.

- A key area of weakness is that 90 percent did not adequately analyze whether key public expenditures were in fact addressing underlying market failures, and what the appropriate role for the private sector was for major sectors and programs. This paper argues that the role of the government versus the private sector should be the principal criterion governing expenditure choice.

- About half of the PERs reviewed did not analyze key programs within sectors, and instead based recommendations on trends in aggregate sectoral allocations. This paper suggests that programs with relatively homogeneous benefits should be a important unit for expenditure analysis.

- There has also been a tendency to rely upon simple international comparisons of expenditure ratios to decide upon the adequacy or inadequacy of particular expenditures. About one-third of Bank PERs have done this in one form or another to arrive at normative judgments. This paper argues that while such comparisons may help identify some egregious anomalies, these then need to be analyzed in greater depth. There is no optimal expenditure ratio across countries. It is therefore erroneous to base expenditure decisions on such international comparisons.

- Less than 10 percent of PERs examined the impact of public expenditures on the poor. Yet, public expenditures are a vital policy instrument to help achieve poverty alleviation objectives. The paper suggests that the impact of major programs on the poor be analyzed using methodologies such as incidence analysis.

- In a majority of PERs, capital and recurrent expenditures were analyzed separately rather than in an integrated manner. While 95 percent of the PERs examined capital investments, only 33 percent examined non-wage operations and maintenance as well. This paper argues that such segmented analysis reinforces capital-led budgeting, which distorts expenditure composition and has an inherently expansionary bias. Consequently, capital expenditures continue to be funded even though non-wage operations and maintenance of existing investments are grossly underfunded. This necessitates analyzing capital and recurrent expenditures in an integrated manner—i.e., ensuring that there are no imbalances in favor of one or the other.

- Finally, only in 20 percent of the PER sample was there some analysis of underlying incentives in the budget process. However, this paper suggests that such analysis is crucial for assessing whether incentives in the underlying budgeting systems reinforce fiscal discipline, help prioritize expenditures and enhance technical efficiency in the delivery of services. In view of the numerous analytical and empirical limitations in public expenditure analysis, it is equally if not more important to carry out such analysis to make it more likely that the dynamics of the budgeting system itself will achieve better expenditure outcomes.

Table 1.3: Coverage of Sectors and Issues in Sample PERs

	Percentage
Macroeconomic framework	85
Functional composition	
Health	100
Education	100
Transport	85
Agriculture	77
Intersectoral allocations	20
Economic composition	
Capital investments	95
Civil service	70
Non-wage O&M	33
Management issues	50

Table 1.4: Current State of Analysis in Sample PERs

	Percentage
Analysis of market failures and role of private sector	10
Analysis of key programs within sectors	50
Analysis based on international expenditure ratios	33
Segmented capital-recurrent analysis	67
Analysis of impact on the poor	10
Institutional analysis	20

Following from the last point, it is not surprising that two recent reviews of PERs have found that they have had limited impact on client countries, donor coordination and the Bank's own lending strategy. A review of 26 PERs carried out by the Netherlands Economic Institute concluded that "PERs have not been very effective in either improving budgetary processes and expenditure allocations, or in serving as an accounting or monitoring instrument for the justification of donor support to the recipient countries" (Netherlands Economic Institute 1995)" An internal review within the Bank also concluded that internalization of the process by the recipient governments had been poor (The World Bank 1995d).

Some recent PERs are however beginning to redress these analytical and process-related shortcomings. For instance, there has been an explicit analysis of underlying market failures and the appropriate role for public expenditures in PERs on Malaysia and Algeria. The PERs on Tanzania and Uganda analyze intrasectoral imbalances across key programs. Further, the recurrent-capital imbalance has been analyzed in depth in some PERs (e.g., Guinea, Mali). The impact of public expenditures on the poor has been an important focus of some recent PERs (e.g., Indonesia, Namibia). Finally, some PERs have placed an important emphasis on institutional issues (e.g., Uganda, Guinea, Nigeria). As already mentioned above, there is an increasing trend towards shorter and more focused annual reports in several countries (e.g., Ethiopia, Uganda), which aim to build government capacity and ownership, and improve the government's budgeting system. The most striking example comes from Ghana where the last two PERs have been carried out by the Government of Ghana itself, and have focused mostly on identifying maladies in the underlying institutional environment and budgetary processes.

These certainly reflect positive directions in some recent and ongoing PERs. Typically, however, these PERs are strong on some aspects, but weak in other important dimensions. Consequently, it is important to present a systematic framework to guide PERs so that the isolated successes can be replicated more generally in other PERs, and more fundamentally, in the government's planning and budgeting process in the future.

2

A Framework for Analyzing Broad Allocations

The evaluation of broad allocations entails analyzing both the ***level*** and ***composition*** of public spending. The bulk of this paper focuses on the latter. However, it is critical that the allocation of public expenditures take place within a consistent macroeconomic framework. Consequently, the framework for analyzing both the level and composition of spending is summarized below.

The macroeconomic framework and the aggregate level of public spending

A key issue in public expenditure analysis is its consistency with the macroeconomic framework. Indeed, control and reduction of the aggregate level of public spending has been an integral element of adjustment programs during the 1980s and 1990s. Developing countries sought to stabilize their economies and restore external and internal imbalances by reducing fiscal deficits and expenditures. For instance, in countries that received adjustment loans from the Bank, budget deficits were cut in half, expenditures were reduced to some extent, and revenues increased (Pradhan and Swaroop 1992).

The macroeconomic impact of budget deficits

Excessive public spending can lead to high or rising budget deficits that can result in different types of macroeconomic imbalances depending upon how they are financed. For instance, if financed through excessive external borrowing, they can lead to a debt crisis; excessive use of foreign reserves leads to crises in the balance of payments; printing money excessively leads to inflation; and too much domestic borrowing leads to higher real interest rates, and crowding out the private sector (Fischer and Easterly 1990). Empirically, cross-section analyses of evidence from 10 countries shows a strong relationship between fiscal deficits and macroeconomic balances (Easterly and Schmidt-Hebbel 1991). These results show that stable and low fiscal deficits are associated with good growth performance. Fiscal balances are positively related to investment and to current account balances. High fiscal deficits show an association with highly negative real interest rates (financial repression), money creation, and high black market exchange rate premia. The aggregate of the ten case studies shows an association between fiscal adjustment in the 1980s, improvement in the current account, and real depreciation of the exchange rate.

Sustainable budget deficit

The permissible aggregate level of public spending depends in large part on the level of the sustainable budget deficit. Whether the deficit is sustainable depends on its size and how fast the economy is growing. This will typically require detailed projections of the future course of the debt-to-GDP ratio based upon assumptions about the demand function for money, the desired inflation rate, the real interest rate, and the growth rate of the economy. If the analysis shows the debt-to-GDP ratio to be rising continually (e.g., in recent projections for Guinea under certain scenarios), the fiscal deficit is unsustainable and fiscal policy needs to be changed.

Comprehensiveness of public sector definition

In evaluating the sustainability of the deficit, the definition of the public sector needs to be as comprehensive as feasible, particularly if a significant part of the public sector deficit is borne by or has been shifted to other levels of government or even the financial sector. The consolidated deficit can be calculated by adding the deficits of the various types of public entities, excluding transfers among these entities. In principle, this should include not only central government, but also state/local governments (particularly in federal structures), social security and extrabudgetary funds. Clearly, such consolidation will be constrained by available data in many countries. However, the failure to consolidate key components that are important in particular countries can seriously distort the macroeconomic consistency of the expenditure framework. For instance, extrabudgetary funds constituted a massive 12 percent of GDP in Ukraine in 1992. In addition, if there are significant deficits and liabilities of public enterprises and even state-owned banks in the financial sector, they are ultimately borne by the government and therefore need to be added to the public sector deficit. For instance, in Bulgaria in 1993, adding the losses of the banking system on account of subsidies on the government's domestic debt helped explain the persistence of inflation in the face of what otherwise appeared to be a moderate fiscal deficit. In particular circumstances, even quasi-fiscal deficits of the Central Bank can be quite critical in providing an accurate picture of the macroeconomic impact of government deficits (e.g., in the 1995 Mexican crisis).

Composition of the deficit

Given a sustainable deficit, the composition of that deficit—i.e., the revenue-expenditure mix—needs to be analyzed. For instance, a recent review of public expenditures for Namibia analyzed four alternative combinations of revenue increases and spending cuts to show that disproportionate reliance on either one to meet the deficit target would be infeasible and undesirable. In analyzing the composition of the deficit, the sustainable revenue can be calculated as the revenue consistent with the tax structure with minimum distortionary costs, or consistent with revenues of other countries with similar tax structures. However, the maximum permissible spending that results as a residual from the sustainable deficit and revenue need not be optimal if it crowds out more efficient private sector spending. For instance, the evaluation of the role of government versus the private sector within and across sectors, as further discussed below, can conceivably reveal that aggregate spending, and hence taxes, can be reduced even below its maximum permissible level. In some circumstances (e.g., in post-civil war Uganda during the late 1980s), the exercise can even reveal that the maximum permissible level of spending is insufficient and therefore inconsistent with the rehabilitation needs to meet the growth and poverty alleviation objectives; additional borrowing in such circumstances need not lead to an unsustainable debt burden. Consequently, the aggregate level of spending must result from an iteration between the maximum permissible spending and the evaluation of the social desirability of the composition of that spending using the criteria governing expenditure choice, as further discussed below.

Framework for analyzing the composition of expenditures

The bulk of this paper focuses on the composition of public spending. The framework for analyzing public expenditure allocations includes (i) identifying criteria or key steps in selecting expenditure allocations; and (ii) applying these criteria to appropriate units or levels of broad allocations, consistent with available information and capacity.

Criteria for analyzing expenditure allocations

The composition of public expenditures should finance the mix of goods and services that governments need to provide to maximize social welfare. In principle, this implies that alternative public expenditure allocations be evaluated and selected using a three-step analysis or criteria, as further explained in a companion paper on project evaluation (Pradhan 1994). These include the following:

The role of the public versus the private sector

First, it needs to be assessed whether there is a rationale for government intervention in general and public expenditure in particular in the area to address underlying market failures. Public expenditures should be concentrated first on goods and services that the private market will not provide or provide too little, rather than merely substituting for or even marginally improving upon the private market outcome. The proposed expenditure should be undertaken by the private sector if it is profitable at prevailing market prices, unless there are some compelling market failures to suggest that government intervention could lead to superior outcomes. This requires identifying the characteristics of demand and supply to assess whether there are specific market failures (e.g., public goods, externalities, non-competitive markets) that may cause the private market outcomes to deviate from socially desirable ones. The type of market failure will indicate the scope for private financing and delivery, and therefore the form that government intervention should take --regulation, financing or outright provision. For instance, while economic principles would suggest that pure public goods (i.e., zero marginal cost of additional consumption) be financed wholly by the public sector, several other publicly-provided goods and services provide at least some private benefits that can be recovered from the private sector, albeit with subsidies to achieve socially desirable outcomes (e.g., for positive externalities, to cover losses from decreasing cost industries where marginal cost is below average cost). Consequently, the scope for private sector financing and/or delivery, together with concomitant reforms in the pricing and regulatory framework, needs to be fully evaluated as a principal, initial criterion in screening public expenditure allocations.

Social cost-benefit of expenditures and outcomes

If there is an underlying market failure, it needs to be assessed how large a discrepancy between social and private values this imposes and therefore how much can alternative expenditure allocations (including subsidies from pricing policy) improve upon the private market. In other words, the social cost-benefit of alternative expenditure allocations need to be computed so as to select those that maximize the net contribution to social welfare. This requires information on the determinants of demand (e.g., willingness to pay, price elasticity of demand, consumer ignorance, externalities) and supply (e.g., size of private sector, performance, substitutability between public and private sectors) to measure the net social impact of expenditure allocations (including subsidies resulting from pricing policies) on private consumption and supply. Consequently, the outcomes of alternative expenditure allocations or inputs (net of their impact on private supply, if any) need to be identified, and the social valuation of alternative outcome-input combinations need to be compared. The traditional theory of public finance sought to evaluate expenditures using shadow prices to value inputs and expenditures.

Impact on the poor

Traditionally, cost-benefit analysis as above has merely summed up all benefits and costs without placing differential weights on various groups, including the poor. However, while this would help meet the criteria for economic efficiency, an explicit evaluation of the implications for the poor is also needed. Given analytical, and empirical difficulties, distribution weights have not been utilized in individual project evaluation, and hence poverty concerns have not been an explicit part of expenditure analysis. However, it may be feasible to analyze the impact of some broad expenditure programs on the poor rather than for each project. In any event, the impact on the poor of alternative expenditure allocations needs to be taken into account to ensure that the composition

of public spending helps meet poverty alleviation objectives. This can be accomplished through various methodologies. One commonly used method is benefit-incidence analysis, which examines how public expenditure allocations benefit or accrue to different income groups, and that should take into account the total costs of these programs, including not only administrative costs but also participation costs of the poor and other behavioral responses.

Choosing the appropriate level and scope of expenditure analysis

Under ideal conditions, each project (investment or recurrent) constituting the entire expenditure program of the government could be subject to the above criteria to select the appropriate allocation of public expenditures. In practice, however, applying the above criteria to the gamut of public expenditure allocations constitutes an impossible task. Indeed, given information and capacity constraints, it would be infeasible to rigorously apply these criteria for even a significant percentage of the thousands of projects and expenditure allocations that comprise a country's expenditure program. Indeed, in most developing countries, information and capacity to evaluate expenditures is quite limited, which must therefore be taken as a given constraint in the short run. Consequently, the real challenge for public expenditure analysis in most countries is to make the best analysis possible given limited information and capacity in the short run. Concomitantly, investments in improved information, systems and capacities can be initiated to carry out such analyses more comprehensively in the medium-to-long run. In light of this, the principal challenge lies in choosing the level and scope of analysis consistent with available information and capacity. And this is also a principal focus of this paper.

In summary, the paper suggests that some egregious expenditure imbalances can often be identified using a few easily applicable criteria and relatively robust stylized facts. For instance, four key areas that can help to simplify and facilitate an otherwise overwhelming exercise can be readily identified. First, applying the first criteria of expenditure choice above to expenditure allocations can help identify public expenditures providing private goods and services for which there is no compelling underlying market failure. This can help restructure the expenditure composition towards activities that provide public goods, large externalities and benefits to the poor. Second, it is easier to apply the three-step analysis to intrasectoral allocations before dealing with more complex issues about benefit valuation under intersectoral allocations. In this context, identification of programs, sets of expenditures within a sector with relatively homogeneous benefits, provides a useful unit of analysis, and helps identify common imbalances across programs. The literature on the social sectors, for instance, provides relatively robust stylized facts about the greater efficiency and equity of programs providing basic social services (e.g., public health, primary education) as opposed to tertiary services (e.g., specialized hospitals, universities). Third, common patterns of input mix imbalances emerge across many developing countries, which are important to analyze in particular country contexts. These include, for instance, the overstaffing of the civil service and the inadequacy of non-wage operations and maintenance. Fourth, incidence analysis as well as other methodologies can be adopted to identify expenditures that are supposed to benefit the poor but in fact benefit the better off.

In addition to the above, a usual temptation is to use international comparisons of expenditure ratios and outcomes to identify imbalances in a country's expenditure composition (see for instance, IMF 1995). To a limited extent, this can indeed provide some initial, useful insights. For instance, a comparison of key sectoral outcomes with countries of comparable levels of development can reveal worrisome anomalies (e.g., poor social indicators in Brazil and Pakistan compared to countries of comparable GDP per capita), which may in part reflect underlying expenditure imbalances. In addition, unusually high or low shares of expenditures for particular sectors, programs or expenditure categories (e.g., wage bill, capital expenditure) in particular countries may point to *potential* underlying imbalances. The paper provides international averages for the share of major expenditures in total spending and GDP (see below), as well as some international averages of social indicators. *However, it is critical to underscore that there is no optimal ratio or norm for expenditure allocations across countries.* The paper urges caution in mechanically using such ratios for expenditure analysis. Differences in

relative prices, state of infrastructure, public-private roles, etc., make it difficult to meaningfully compare such ratios. Consequently, it would be erroneous to base expenditure assessments on such comparisons alone. At best, such comparisons may reveal gross anomalies in particular expenditure allocations, which then need to be analyzed in greater depth using the three steps suggested above.

While simplifying methodologies and stylized facts can be used to some extent, numerous difficult issues will undoubtedly remain for expenditure analysis. A principal problem stems from difficulties in estimating the impact of public expenditures on the poor. This has typically been estimated through benefit incidence analysis, which attempts to measure how different expenditures benefit groups with different levels of well-being. The most common method, and the one employed in the seminal analyses by Meerman (1979) and Selowsky (1979), consists of four steps. First, everyone is ranked by level of well-being—usually a measure of income or consumption. Second, the average use of the relevant public service for each group is estimated, typically using data from household surveys. Third, the public expenditure or the cost to the government of providing the service is taken as a proxy for the benefit of consuming that service. Fourth, the level of well-being is compared before and after the intervention by adding the assumed benefit level to the pre-intervention welfare measure (Jimenez 1995). It is important to note that many benefit incidence analyses have various limitations: the costs or public expenditures for particular services are a poor proxy for benefits received; behavioral responses of beneficiaries and nonbeneficiaries are not taken into account; and the "pre-intervention" counterfactual is therefore lacking. A number of recent studies have used various estimation-based techniques to model and incorporate behavioral responses that have typically been lacking in incidence analyses (van de Walle and Nead 1995). The contribution of behavioral approaches is to obtain a better measure of the distribution of welfare without intervention (i.e., the counterfactual), and thereby work out the real impact of policy. For instance, studies by Cox and Jimenez, Sahn and Alderman, and Ravallion and Datt in van de Walle and Nead (1995) illustrate how econometrically estimated parameters and simulation techniques allow what are basically benefit-incidence studies to be modified to incorporate incentive effects and thereby attain a more precise estimation of the distribution of net benefits from public spending across households. However, heavy data requirements and methodological pitfalls (simultaneity, endogeneity, self-selection biases) have constrained empirical analysis under behavioral approaches. Despite their limitations, incidence analysis is less demanding on data, and can provide a useful first approximation of the distributional impact of public spending, while more investment in data and empirical research yields more accurate insights through behavioral approaches over a period of time.

To carry out even the more simplified scope of expenditure analysis for the vast gamut of public spending, it becomes important to choose appropriate levels of aggregation so that conclusions about expenditure choice can be made based upon limited information and capacity. It is useful to begin with the more aggregated expenditure classifications (i.e., classifications with relatively homogeneous benefits), and work down to more disaggregated levels to the extent necessary and feasible. This approach has the advantage that if an aggregated expenditure category is deemed not to be socially beneficial (e.g., based upon public-private roles), then it would mitigate the need to analyze its disaggregated, constituent components. In addition to choosing appropriate levels of aggregation, it is useful to classify public expenditures in economically meaningful categories, which may not correspond to budgetary or administrative categories, but that facilitate the analysis.

Expenditure classifications

In this context, it is useful to begin by considering the functional and economic composition of expenditures, as defined in the IMF's *Government Financial Statistics* (GFS).

The **functional composition** is based upon the purpose or function toward which the expenditure is directed, and is also referred to as sectoral expenditures. As shown in Box 2.1, this in turn can be classified under four general headings:

- *Economic services* cover expenditures associated with the regulation or more efficient operation of businesses, including transport, electricity, agriculture and industry.
- *Social services* cover government services supplied to the community and households directly, such as education, health, sanitation, etc.
- *General government services* include general public administration, defense, public order and safety.
- *Other functions* include interest and general transfers to other organs of government.

Box 2.1: Functional Classification of Expenditures

Economic services	*Social services*
Transportation (road, water, railways)	Education
Fuel and energy services	Health
Agriculture, forestry, fishing	Social security and welfare Water supply and sanitation
Mining and manufacturing	
General public services	*Other functions*
Executive and legislative organs, finance, external affairs	Interest
Defense	General transfers to other organs of government
Public order and safety	

The **economic composition** of expenditures depends upon the type or economic characteristics of the transactions on which resources are spent. As shown in Box 2.2, this in turn can be classified as follows:

- Capital expenditures cover payments for the purchase or production of new or existing durable goods, or goods with a life of more than one year, to be used for nonmilitary productive purposes—e.g., bridges, roads, school buildings, health clinics, etc.
- Current or recurrent expenditures include wages and salaries, other goods and services (including non-wage operations and maintenance "O&M"), interest payments, and subsidies and other current transfers.

Box 2.2: Economic Classification of Expenditures

Current expenditures
Expenditures of goods and services
  Wages and salaries
  Employer contributions (social security, pensions)
  Other goods and services
Interest payment
Subsidies and other current transfers (to public enterprises, other levels of government, households)

Capital expenditures

Between the functional and the economic classification of expenditures, the paper argues that it is useful to begin with the functional classification because it is based on a similar purpose or function or benefits. Indeed, it becomes difficult to analyze the economic composition at an aggregate level, e.g., aggregate allocations for capital investments, O&M, civil service employment, or subsidies, without a good knowledge of the functional composition in the first place. This is because more disaggregated knowledge is needed at the sectoral and program level about which public investments are socially undesirable, the evidence on underfunding of non-wage

O&M in particular areas, and where there is overstaffing of the civil service. This may well reveal common patterns about the economic composition that cut across sectors. Consequently, the paper suggests starting with the functional composition, and analyzing the economic composition within and then across functional categories in an integrated manner as further described below.

In analyzing the functional composition of expenditures, it is important to ascertain the constitutional division of functional responsibilities among various levels of government (i.e., unitary, federal, cofederal), which will have a critical bearing on the nature of expenditure analysis. For instance, a federal form of government has a multi-tiered structure of decisionmaking, with the national government deciding about national public goods (defense), and subnational governments having independent or concurrent responsibility about local public services (e.g., basic health, primary and secondary education). Economic theory suggests that such decentralized decisionmaking can in principle enhance allocative efficiency and social welfare because lower levels of government may be better being able to map expenditures to meet local preferences, provided economies of scale and benefit-cost spillovers have been taken into account. In such structures, it becomes imperative to analyze not only the assignment of expenditure functions and tax revenues across levels of government, but also the efficiency and equity implications of the design of intergovernmental fiscal transfers (e.g., block grants, specific-purpose grants, matching grants) to offset vertical and horizontal imbalances, interjurisdictional spillovers, etc. To keep its scope manageable, this paper does not focus on intergovernmental fiscal relations. Some related issues pertaining to intergovernmental transfers are summarized below, and a few institutional implications are mentioned in Chapter 7. However, the reader is referred to the large literature on the subject for a detailed discussion (see Shah 1994 for a review).

Analyzing the functional composition of expenditures

The functional composition consists of allocations across and within sectors, such as education, health, transport, defense. Tables 2.1-2.3 provide the functional composition of expenditures across regions and over time, as a share of GDP and as a share of total expenditures. Starting from the highest level of aggregation, expenditure analysis needs to inform how a given aggregate level of spending should be allocated across sectors (i.e., intersectoral allocations) to maximize social welfare. This would imply carrying out the three-step analysis above for sectoral expenditures to identify those which have an appropriate rationale for public expenditures, and to identify alternative combinations of sectoral expenditures and outcomes (including impact on the poor).

Table 2.1: Means of Government Expenditures in Developing Countries
(functional classification)

Variables	*1975-79*	*1985-89*	*1990*
Percentages of GDP			
Total expenditure	21.86	24.44	20.78
General public service	7.11	6.97	5.46
Defense	3.14	2.76	2.29
Social services	6.31	6.92	6.51
Education	3.16	3.13	2.83
Primary & secondary	2.01	2.13	2.24
Tertiary	0.52	0.45	0.39
Others	0.57	0.53	0.27
Health	1.26	1.34	1.22
Hospital	0.88	0.81	0.45
Clinic	0.09	0.19	0.24
Others	0.36	0.32	0.34
Social security & welfare	0.91	1.24	1.40
Welfare	0.12	0.14	0.11
Housing	0.54	0.75	0.57
Economic services	5.86	5.54	4.38
Energy	0.59	0.48	0.24
Agriculture	1.57	1.64	1.22
Industry	0.56	0.67	0.38
Transport & communication	2.20	1.63	1.27
Road	1.17	0.80	0.68
Other functional expenditure	2.61	4.51	4.36
Percentages of total expenditure minus interest payment			
General public services	33.45	36.18	35.9
Defense	13.93	13.84	13.16
Social services	30.73	33.76	38.5
Education	15.60	16.03	17.24
Primary & secondary	9.65	10.88	13.17
Tertiary	2.45	2.09	2.33
Others	2.67	2.66	2.23
Health	6.00	6.59	8.25
Hospital	4.05	4.13	4.14
Clinic	0.35	0.99	1.55
Others	1.75	1.56	2.46
Social security & welfare	4.68	5.89	8.13
Welfare	0.66	0.71	1.07
Housing	2.55	3.57	3.89
Economic services	26.99	24.93	23.28
Energy	2.54	2.01	1.94
Agriculture	7.23	7.02	6.00
Industry	2.22	2.61	2.14
Transport & communication	10.42	7.98	7.56
Road	5.67	3.81	4.11
Other functional expenditure	13.75	24.28	25.08

Source: GFS, local current currency.

Table 2.2: Means of Government Expenditures in Developing Countries by Regions, Average of 1985-89 (functional classification)

Variables	*E. Asia*	*S. Asia*	*S-S. Africa*	*LAC*	*MENA*
Percentages of GDP					
General public services	6.34	6.21	6.88	5.3	9.88
Defense	2.07	2.59	1.81	1.62	5.59
Social services	7.96	5.80	5.72	5.64	9.14
Education	4.8	1.82	3.12	2.77	3.2
Primary and secondary	3.26	0.95	2.19	1.73	2.09
Tertiary	0.63	0.23	0.69	0.17	0.5
Other	0.63	0.54	0.4	0.6	0.47
Health	1.75	0.94	1.29	1.22	1.47
Hospital	0.86	0.5	0.98	0.77	0.78
Clinic	0.14	0.02	0.03	0.07	0.48
Others	0.38	0.18	0.34	0.28	0.37
Social security and welfare	0.66	1.35	0.53	0.88	2.71
Welfare	0.64	0.6	0.07	0.13	0.16
Housing	0.56	1.02	0.64	0.57	1.08
Economic services	6.12	7.21	5.72	3.65	6.66
Energy	0.27	0.66	0.33	0.26	0.97
Agriculture	2.05	2.69	1.97	0.92	1.47
Industry	0.44	0.7	0.58	0.25	1.41
Transport and communication	2.32	2.19	1.57	1.25	1.48
Road	1.09	1	0.84	0.69	0.63
Other function expenditure	4.21	4.19	5.2	4.05	4.68
Percentages of total expenditure					
General public services	28.22	29.22	29.66	30.63	35.59
Defense	10.87	11.99	8.46	9.74	21.01
Social services	33.51	26.5	26.18	31.34	28.59
Education	20.45	8.95	13.98	14.85	10.73
Primary and secondary	15.34	6.15	9.64	9.69	7.28
Tertiary	2.64	1.14	2.81	1.12	1.63
Other	2.56	2.24	1.51	3.12	1.62
Health	7.03	4.2	5.47	7.21	4.35
Hospital	3.89	2.15	4.11	4.77	2.19
Clinic	0.78	0.09	0.15	0.88	1.38
Other	1.52	0.87	1	1.66	1.16
Social security and welfare	3.09	5.66	2.29	5.48	8.23
Welfare	0.31	3.06	0.31	0.91	0.48
Housing	2.19	5.36	2.44	3.11	3.28
Economic services	25.17	30.56	22.19	18.56	20.47
Energy	1.31	2.2	1.32	1.31	2.88
Agriculture	8.12	11.17	7.44	4.06	4.67
Industry	1.89	2.88	2.17	1.23	4.1
Transport and communication	9.36	9.7	6.21	7.58	4.31
Road	4.67	4.48	3.46	4.26	1.72
Other function expenditure	18.26	16.07	21.64	18.63	16.27

Source: GFS, local current currency.

Table 2.3: Means of Net Government Expenditures in Developing Countries by Regions, Average of 1985-89 (functional classification)

Variables	*E. Asia*	*S. Asia*	*S-S. Africa*	*LAC*	*MENA*
Percentages of total expenditure minus interest payment					
General public services	33.02	30.86	33.88	38.81	38.84
Defense	12.98	14.85	9.71	12.03	21.25
Social services	39.1	27.32	29.55	37.25	32.5
Education	23.98	7.48	15.89	17.31	12.42
Primary and secondary	17.48	4.06	10.58	10.87	8.25
Tertiary	3.1	0.55	3.19	1.37	1.71
Other	2.95	3.16	1.61	3.84	1.74
Health	8.1	3.88	6.3	7.99	5.01
Hospital	4.43	2.17	4.62	5.21	2.53
Clinic	0.99	0.12	0.16	1.01	1.75
Other	1.76	0.85	1.11	1.97	1.34
Social security and welfare	3.64	6.14	2.65	7.45	9.03
Welfare	0.37	2.54	0.35	0.94	0.55
Housing	2.73	7.29	2.74	3.59	3.77
Economic services	30.01	31.37	25.29	23.08	21.7
Energy	1.65	1.65	1.63	2.01	2.81
Agriculture	9.52	10.1	8.59	5.26	4.8
Industry	2.11	3.06	2.53	1.41	4.6
Transportation and communication	11.18	10.6	17.12	8.91	4.7
Road	5.52	2.28	4.04	4.56	1.79
Other function expenditure	22.58	29.23	26.13	38.4	20.04

Source: GFS, local current currency.

In this context, *a program as a set of expenditures within or across sector with relatively homogeneous benefits* constitutes a useful unit of analysis. Given large interdependencies and externalities across sectors (e.g., mother's education improves children's nutrition), a program could well be a multisectoral set of expenditures aiming to achieve a particular set of benefits or government objectives (e.g., reduced infant mortality, or integrated child development). For simplicity in exposition, however, the paper illustrates the application of the framework by concentrating first on relatively homogeneous programs within sectors, although as further discussed below, the same principles can be applied to multisectoral programs under intersectoral allocations. Key programs within sectors are those which have relatively homogeneous underlying market failure, nature of benefits or impact on the poor. To begin with, this would imply identifying programs with different underlying market failures and rationale for public expenditures, and within this, disaggregation based upon the nature of net benefits or the impact on the poor. The greater the homogeneity of benefits within programs, the more accurate the analysis. This would imply seeking as fine a disaggregation in the level of analysis as feasible, down to the level of individual capital investment projects or recurrent expenditure items. However, given data and capacity constraints in many countries, this paper argues that meaningful public expenditure analysis can take place first at the level of the particular programs identified below (e g., primary education, public health, clinical services, major road segments, agricultural research, fertilizer subsidy). These can often provide relatively robust stylized facts—admittedly based upon more disaggregated project-level analysis from within the country or from other countries which may need to be adjusted for scale effects and marginal versus average impacts—that can be used to evaluate allocations across programs. Following this, to the extent feasible, key capital and recurrent expenditures within programs can be analyzed using the criteria above.

However, applying the three criteria to aggregate sectoral expenditures suggest that only limited analysis of allocations across sectors, or intersectoral allocations can be made without first analyzing allocations within sectors, or intrasectoral allocations. While public expenditures in a sector such as industry are inappropriate because they finance the production of private goods without underlying market failures, the analysis is more complicated for other aggregated sectoral expenditures. This is because a sector contains expenditures with very different public-private roles, net benefits and impact on the poor. For instance, a sector such as health or education contains some programs which have a rationale for government intervention and public expenditures (e.g., expenditures providing public goods and large externalities such as public health and primary education), and other programs that do not (e.g., tertiary health care, university education). Further, sectoral programs can produce vastly different sectoral outcomes (e.g., basic literacy or reduction in infant mortality), including impact on the poor. In this context, it becomes difficult to identify sectoral allocations which will maximize social welfare without knowing what programs these sectoral expenditures are financing and what their corresponding outcomes will be. Consequently, it becomes difficult to analyze relative allocations across sectors, without analyzing relative allocations within sectors.

Intrasectoral expenditure analysis therefore entails (I) identifying and assessing major sectoral programs based upon the nature of underlying market failures and their public-private rationales; (ii) comparing the social cost-benefit across programs based upon the outcomes associated with different program expenditures and where feasible, the social valuation of outcomes-expenditure combinations; (iv) comparing the impact of major program expenditures on the poor; and (v) to the extent feasible, analyzing key capital and recurrent expenditure within programs using the same three criteria above. Intrasectoral analysis can therefore help identify reallocations across programs and expenditure items within the sector which contribute to efficiency and equity. And it can identify programs within sectors which have a legitimate rationale for public expenditures, and alternative combinations of program expenditures and sectoral outcomes. This can then be used to inform intersectoral analysis, or the mix of sectoral expenditures and outcomes that maximize social welfare.

The three chapters (Chapter 3 to 5) that follow apply the general framework above to intrasectoral expenditure analysis in key sectors such as health, education, and economic infrastructure and agriculture. These help to inform intersectoral expenditure analysis in Chapter 6. Consequently, the rest of this chapter focuses on identifying a framework and issues for analyzing the economic composition of expenditures within and across sectors.

Analyzing the economic composition of spending

As already mentioned, the economic composition needs to be first analyzed within sectors, before common, cross-sectoral patterns can be identified. This section identifies a framework and associated issues in the analysis of the economic composition of spending within and across sectors.

There are often patterns of under- and overspending for the economic composition that cut across sectors or functional categories in many developing countries. These include the bias toward new capital investments, the underfunding of non-wage O&M, overstaffing of a poorly paid civil service. To correct these problems, it is essential to undertake *an integrated analysis of the economic composition*— capital/recurrent and wage/non-wage balances—within each major program. This involves (i) compiling data on the economic composition of major programs; (ii) weeding out unproductive programs using the criteria as discussed earlier; and (iii) examining the capital-recurrent and wage/non-wage balance within each program. This proposed approach constitutes a major departure from the capital-led budgeting and fragmented analysis of the economic composition that is actually carried in many countries, as further explained below.

The economic composition of public spending consists of capital and current expenditures, and within current expenditures, wages and salaries, non-wage operations and maintenance, interest payments, subsidies and other current transfers. Table 2.4 presents the economic classification of total government expenditures both as a percentage of GDP and as a percentage of total expenditures or all developing countries for three time periods. As shown there, recurrent expenditures typically dominate total expenditures, and have stayed relatively stable over the second half of the 1980s, accounting for about 80 percent of total spending. In light of this, the evaluation of only investment spending without including recurrent expenditures (as is done in Public Investment Reviews) can be quite limiting.

Table 2.4: Means of Government Expenditures in Developing Countries
(economic classification)

Variables	*1975-79*	*1985-89*	*1990*
Percentage of GDP			
Total expenditure	21.86	24.44	20.78
Current expenditure	16.02	19.63	16.87
Goods and services	11.87	9.22	11.61
Wage	6.48	7.12	6.16
Other goods and services	4.80	4.87	3.06
Interest payment	1.24	3.12	3.85
Subsidy and transfers	4.68	3.78	3.43
Capital expenditure	4.89	4.18	5.8
Fixed capital	4.28	3.30	2.48
Percentage of total expenditure			
Current expenditure	75.09	80.92	80.97
Goods and services	50.2	51.48	52.31
Wage	30.38	30.65	31.69
Other goods and services	20.74	18.32	19.31
Interest payment	5.56	12.53	13.80
Subsidy and transfers	18.55	15.71	16.57
Capital expenditure	18.83	19.54	24.44
Fixed capital	17.83	12.46	11.75

Source: GFS, local current currency.

Capital investments

Capital investments are typically grouped under the Public Investment Program (PIP). In many developing countries, the PIP has consisted largely of donor-financed projects. Projects were typically conceived, designed, and appraised by donors themselves. The evaluation of public expenditures in the 1970s and 1980s took the form of Public Investment Reviews (PIRs), and focused exclusively on the evaluation of the PIP. These PIRs primarily sought to derive an aggregate ceiling for public investments based upon an ICOR-driven model of the economy, and select projects within this ceiling based on a ranking of economic rates of return. There were, however, a number of limitations in this approach to evaluating capital investments. A principal weakness of this approach was that it led to donor-driven, capital-led budgeting. Individual capital investments were funded while their consistency with larger sectoral priorities were ignored, recurrent costs of existing investments were grossly under-funded, and the significant recurrent cost implications of a growing investment program were not taken into account. Furthermore, it was impossible to evaluate more than a small percentage of projects because of capacity constraints and considerable analytical as well as empirical difficulties in valuing benefits in key sectors.

In light of these shortcomings, the paper proposes that four steps towards a more integrated approach to capital budgeting be undertaken.

Project profiles, the public investment program and the development budget

First, the list of capital investments within each key sector and program needs to be compiled. This is not as straightforward as might appear. As mentioned above, capital investments in many developing countries are typically grouped under the PIP. A PIP typically contains an initial discussion of the government's overall development objectives and the macroeconomic framework, description of sectoral strategy and planned investments by sector, and a set of individual project profiles (Bird and Stevens 1991). The project profiles, in turn, contain the project description and location, the total cost of the project and its annual phasing, the breakdown of local and foreign exchange costs, and its financing, if identified.

While project profiles and the PIP can provide much of the data for evaluating capital investments, the plan in many countries may, unfortunately, not be fully integrated into the annual budget. In other words, there may be projects in the plan that are not included into the budget and vice versa. In the case of the former, there could be projects that do not go through the budget because they are administered and financed directly by aid agencies. Moreover, this may also indicate that there are projects that have been approved (presumably by donors and the Ministry of Planning), but that have received insufficient domestic, counterpart funding, which will point to the oft-observed problem of delays in project implementation. Indeed, in Uganda, the projection of capital investment in the PIP was 3 to 4 times (and $300-400 million) higher than that shown in the development budget. This could be symptomatic of a more fundamental problem of *coordination between the Ministry of Finance and the Ministry of Planning* in countries where there is a split in these functions. In the case of projects that are in the development budget (or the capital investment part of the government budget) but not in the PIP, this may either reflect small capital items (e.g., buildings and equipments) of government departments as well as wholly locally-financed capital investment projects. In the case of the latter, the omission from the PIP means that projects may get funded that have not been sufficiently or rigorously evaluated. In general, it is important to foster a full *integration of the plan with the budget* to ensure that all capital investments are brought under scrutiny and systematic evaluation.

Evaluating program-level aggregation of projects

Second, capital investments need to be aggregated within major programs, and program-level analysis as discussed above undertaken to weed out capital (and recurrent) expenditures for programs of dubious economic viability. For instance, PIRs in Indonesia in 1985 and in Egypt in 1991 used such an aggregation to analyze and recommend substantial reallocations of planned public investments for major programs within and across sectors. A review of the role of government versus the private sector led to a significant shift in the PIP from manufacturing to infrastructure in Pakistan and Turkey during the 1980s; more recently in Central and Eastern Europe (e.g., Poland, Latvia, Estonia), this has helped screen out large numbers of investment projects of a commercial nature (e.g., cement factories, steel mills) inherited from the central planning era.

Evaluating the recurrent-investment balance of existing as well as new investments

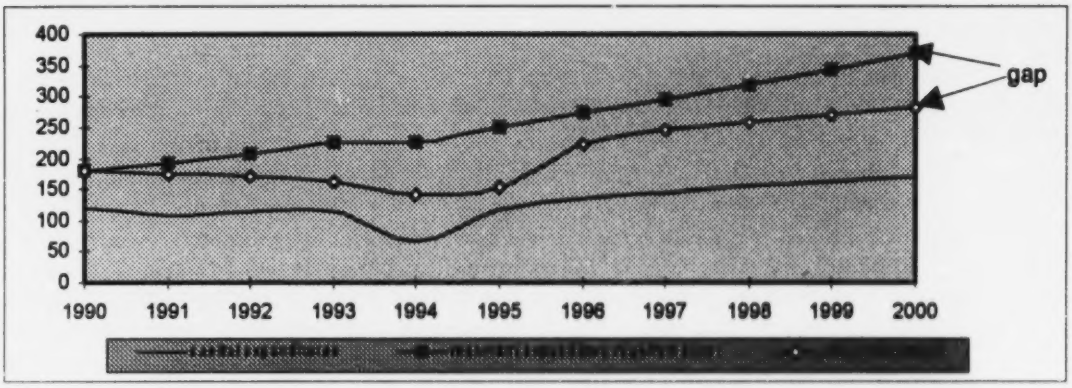
Third, the bias in favor of capital investments needs to be analyzed and redressed by undertaking an integrated analysis of capital versus recurrent expenditures within major programs. The bias in favor of capital investments also needs to analyze and address the traditional bias in favor of new investments versus recurrent costs. This was driven in significant part by ***donor-driven investment programs*** in many developing countries. Given donor financing of investment projects through grants or concessional terms, governments undertook these projects even if they did not accord with the government's priorities, and even if existing or new investments could not be subsequently operated or maintained. Indeed, donor-driven investment projects balkanized the budget, and

capital investments drove the expansion of the budget without the subsequent recurrent costs being taken into account. Donor practices have begun to change discernibly of late, with more financing of recurrent expenditures as well as some encouraging moves toward financing slices of sectoral expenditure programs (integrating recurrent and investment expenditures).

Nevertheless, the problem is far from solved, and it is important for the evaluation of capital investments to take into account two issues pertaining to recurrent costs: the adequacy of recurrent cost funding for both existing and new investments. *First*, in funding new investments or in evaluating the broader aggregation of programs, it is important to ask whether existing investments in the sector are being properly operated and maintained. As further discussed below, in many instances, operations and maintenance of existing investments has much higher returns than investing in new projects, but are grossly underfunded. For instance, in a sample of almost 80 Bank projects, it was estimated that new construction projects in roads had a rate of return of 24 percent while maintenance projects had a return of 45 percent. A recent Bank study estimates that $40-45 billion will need to be spent on road repairs when $12 billion would have sufficed to maintain the roads.

Second, it is important to ensure that the recurrent cost implications of new investments are adequately taken into account. Ideally the project profiles should have estimates of their recurrent cost implications. In the absence of this, the recurrent cost implications can be estimated using rough estimates of average recurrent costs of new investments in each sector. A useful concept in this regard is the *r* coefficient, or the ratio of net recurrent expenditure requirements to total investment cost of a project. It is important to note, however, that the *r* coefficient is based on a rough average estimate; the *r* coefficients that have been used were calculated by Heller (1979) quite some time back. Consequently, the estimates that emerge are merely rough estimates. However, a recent econometric estimate for road maintenance using cross-country data found the *r* coefficient to be in the same range as Heller's original estimate (Humplick and Faiz 1995). When an *r* coefficient is applied onto a PIP, it is important to ensure that the PIP contains primarily capital investment projects. In fact, PIPs can contain many expenditures that are primarily recurrent in nature, and the mechanical application of the *r* coefficient to this total is likely to be misleading. Keeping these caveats in mind, applying *r* coefficients (perhaps updated and adjusted to reflect country-specific realities) can help roughly estimate the total recurrent cost implications of the present investment programing the context of a medium-term expenditure planning exercise. In many countries, this is likely to reveal that there are not likely to be sufficient resources to fund the recurrent cost implications of planned investments. Used in this manner, the *r* coefficient can be an important tool for addressing the bias in favor of new investments. For instance, in Mali and Ghana the computation of recurrent costs of the PIP using *r* coefficients helped demonstrate the unstainability of the investment program in the medium term. Some preliminary analysis for Guinea shows that the "recurrent cost gap" using *r* coefficients could be as much as 23 percent of total requirements by the year 2000 (Figure 2.1).

Figure 2.1: Guinea: Computation of Recurrent Funding Gap



Source: World Bank (1995a).

Table 2.5: Selected r Coefficients for Developing Countries

Sector	*r coefficient*
Fisheries	0.08
Agriculture	0.10
Rural development	0.08-0.43
Primary schools	0.06-0.70
Secondary schools	0.08-0.72
Rural health centers	0.27-0.71
Urban health centers	0.17
District hospitals	0.11-0.30
Buildings	0.01
Feeder roads	0.06-0.14
Paved roads	0.03-0.07

Source: Heller (1979).

Evaluating major projects in key sectors

Fourth, only major projects within key programs should be subject to rigorous economic evaluation, especially to identify large, capital-intensive "white elephants." Here, cost-benefit analysis has been useful in weeding out or deferring major projects. Cost-benefit analysis of major projects in economic services such as physical infrastructure has indeed been quite useful in identifying and attempting to weed out "white elephants." This was a principal thrust of Public Investment Reviews during the 1970s and 1980s. In Costa Rica, for instance, this helped defer investments in new railways; in Côte d'Ivoire, this led to the postponement of the Abidjan-to-Yamoussoukro four-lane divided highway; in Ghana, to reduced investment in additional grain storage (Pradhan and Swaroop 1992).

Wages and salaries: Civil service pay and employment

Typically, public sector employment and wage bills grew rapidly in the 1960s and 1970s, without a commensurate increase in the quantity or quality of service delivery. Governments became the employer of last resort. Confronted with fiscal austerity during the 1980s, most countries have made some progress in this area by checking the rapid growth in employment and the wage bill. However, actual declines have been few and

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infrequent, and the balance between wages and non-wage O&M has worsened in many instances, as resources for non-wage O&M have declined.

The evaluation of civil service wages and salaries entails examining three key dimensions: (1) the total wage bill, (2) civil service employment, and (3) civil service pay, including average pay and the structure of pay scales.

The total wage bill

Some general assessment of whether the wage bill is excessive is typically based on broad indicators such as trends or international comparisons in the ratio of personnel expenditures to total revenues or total expenditures (Stevens 1993). While these can point to egregious anomalies over time or across countries, such comparisons by themselves can be misleading as they can reflect different wage rates, scale of public services, etc. Using the principle of cost-benefit analysis, the question is whether the marginal resources spent on the wage bill are contributing to commensurate benefits, and whether these resources would generate higher returns elsewhere. In this context, a more meaningful assessment can be derived from assessing the degree to which non-wage recurrent expenditures are crowded out by the wage bill as further discussed below, or whether socially profitable new investments cannot be funded. Indeed, a key consideration is the relative priority or balance between spending on wage versus non-wage components. In many countries, high or rising expenditure on the wage bill can squeeze out non-wage expenditures, resulting in shortfalls in key complementary inputs for civil servants to be effective. In addition, the wage bill could be judged excessive if there is underlying, excessive civil service employment with low or zero productivity. At the same time, there may be a productive use of resources within the wage bill if, for instance, the savings from reducing excessive employment can be used to raise average pay and decompress pay scales. This can improve incentives and the effectiveness of the civil service in the delivery of public services and constitute a high return expenditure item. Consequently, the problem may not merely be the level of the wage bill, but restructuring priorities within the wage bill.

Civil service employment

Whether there is *excessive or surplus civil service employment* ultimately depends upon the appropriate role of government within and across sectors. This involves identifying the major programs where civil servants are employed, evaluating whether government spending on these programs is justified, and assessing the appropriateness of the wage/non-wage balance within these programs. To undertake such an analysis, a key challenge in many developing countries is to get accurate data on the growth and breakdown of employment. Indeed, the most obvious manifestation of excessive employment is the existence of "ghost" workers, which can be identified through a proper accounting of civil service employment with payroll lists and the Employment Register. In Uganda, for instance, such an exercise revealed not only large numbers of "ghost" teachers but entire "ghost" schools! Another manifestation of overstaffing is the significant employment of civil servants in programs of dubious economic justification. Indeed, with data on civil service employment by sector and program, program-level evaluation as discussed earlier may reveal that the bulk of employment is in programs that can be eliminated or privatized (e.g., state farms in Uganda). The so-called functional review of ministerial portfolios in several countries (e.g., the Gambia) seeks to identify surplus employment in specific areas, although not necessarily through an economic evaluation of programs within ministries. Within economically viable programs, the growth of public employment over time can be analyzed to identify whether civil service employment related to the expansion in scale of appropriate service provision. In many countries during the 1960s and 1970s (e.g., Tanzania and Kenya), the government became the employer of last resort, and civil service employment expanded across-the-board, quite unrelated to any commensurate increase in the quality or quantity of service delivery. One particular area within programs where such growth has occurred in several countries pertains to daily paid staff, who are typically hired outside the scrutiny of the Establishment Register. A final, key analysis of whether there is overstaffing within programs would depend upon whether critical, complementary

non-wage O&M expenditures (e.g., textbooks per student, supplies, drugs and syringes in health programs) are grossly inadequate and underfunded, as further discussed below.

Civil service pay

In the context of increasing employment, limited fiscal resources and high inflation, average civil service pay declined. Non-wage benefits proliferated to mitigate the fall in real pay. At the same time, the wage structure got compressed, leading to low ratios between the highest and lowest civil servant salaries, making it difficult to attract and retain qualified staff (e.g., Tanzania, Guinea, the Gambia, Ghana, Uganda). Consequently, the reform of civil service pay has sought to reverse the erosion of salaries and decompress the wage structure.

It is easier to get information on pay scales than on employment. Government scales are typically published in budget documents (Stevens 1993). In addition, these are usually based upon a review by the civil service salary commission, and the report of the commission provides a valuable starting point for reviewing pay scales. With the information on pay scales, compression ratios, or the mid-point of the top scale to the mid-point of the lowest scale, and their trends over time can be computed (e.g., Tanzania). In addition, public sector pay can be compared with private sector pay at comparable levels. These can be combined to form some assessment of the adequacy of civil service pay at different levels. Using information on employment by salary grade, alternative scenarios of salary decompression can be projected and considered.

Table 2.6: Data Needed for Civil Service Employment Analysis

Employment	*t-10*	*t-5*	*t*	*t+1*
By Ministry/Dept.				
By Service				
Civil service				
Teaching service				
Local government				
Health workers				
By salary grade				
Grade 1				
Grade 2				
Grade 3				

Source: Budget documents, MOF, Public Service Commission.

In evaluating civil service pay, it is critical to take into account non-monetary allowances. As mentioned earlier, with a decline in real pay, non-monetary allowances proliferated and in several instances became more important than monetary pay. Unfortunately, data on these allowances are not readily available or published, and would require compilation through interviews. For ministers and senior government officials, the non-monetary compensation would come in the form of provision of public housing, temporary staff, vehicles, etc. However, housing stock is limited, and in general, the allowances may be quite unevenly distributed across the civil service.

The reform of civil service pay and employment is essential to improving the effectiveness of the civil service, and becomes an essential precondition for reaping the intended benefits of public expenditure programs. Reforms focus on (i) reducing employment through reducing ghost workers, voluntary and early retirement, freeze on new hiring, and retrenchment based on functional reviews; and (ii) using the savings from retrenchment to decompress salary scales, incorporate allowances into monetary pay, and raise real pay over time.

Non-wage operations and maintenance

The evaluation of *non-wage O&M* is a vital and integral element of the evaluation of the economic composition within major programs. Operations and maintenance expenditures (O&M) consist of recurrent outlays necessary to sustain a project or program at the intended level. Operations expenditures are those entailed in the actual delivery of services, while maintenance is concerned with keeping the infrastructure in a serviceable condition. Some maintenance expenditures (e.g., rehabilitation as opposed to routine and periodic maintenance) can be capital in nature. In the case of physical infrastructure such as roads, the physical condition determines service quality, and consequently, maintenance is more important for these services. For social services, labor is more important than associated capital infrastructure, and these services are therefore more operations-intensive. For other programs, such as irrigation, both operations and maintenance expenditures are significant (Heller 1991).

Underfunding of non-wage O&M often results in underuse or inefficient use of capital investment and requires frequent and costly repairs. But as interest payments have risen and wage bills have held steady, spending on other, complementary goods and services, including non-wage O&M expenditures, has been squeezed. A review of country experiences strongly indicates a reduction in non-wage O&M spending—and a marked deterioration in infrastructure and services—across a range of countries (Pradhan and Swaroop 1992). Some countries have experienced a collapse of effective service delivery—schools without teaching materials, health clinics without drugs and supplies, and rehabilitated roads once again becoming impassable because of the absence of subsequent maintenance. For instance, in Kenya the share of civil service pay and employment escalated during the 1980s while non-wage O&M declined precipitously, ultimately amounting to less than half the price of a textbook per student; in Costa Rica, non-wage O&M dropped by 80 percent during the 1980s, resulting in poor or very poor condition of that national road network; in Indonesia irrigation infrastructure deteriorated during the 1970s and early 1980s on account of inadequate O&M. This is unfortunate, given that such expenditures often have very high rates of return. For instance, the expected return to efficient non-wage O&M in the irrigation sector in Indonesia in the mid-1980s is estimated at 117 percent in Java and 90 percent off Java. A Bank report found that in the transport sector, specific road improvements have an estimated return of 13 rupiahs for each rupiah spent. These high economic returns often justify a higher priority for expansion of maintenance expenditures than for outlays for new construction in a number of countries. Unfortunately, increases in non-wage O&M do not yield the political dividends that new and visible capital investments do. Nor do declines in their allocations have the same political costs as a retrenchment in civil service employment, erosion of real salaries, or elimination of subsidies. This expenditure category has thus been cut along with capital investment, but unlike capital investments, its starting point was unsatisfactorily low to begin with (Heller 1991).

Evaluating O&M expenditures poses problems in terms of cost-benefit analysis. By definition, outlays on O&M are used for the contemporaneous production of public output. The physical relationship between the inputs and current output with a given capital stock constitutes the principal benefit from increases or decreases in O&M. However, policy analysts often have insufficient information for valuing these outputs. Consequently, in practice it has only proven feasible to establish operational norms for services and infrastructure known to be socially beneficial. While this is all that is feasible, it becomes very difficult during fiscal retrenchment to assess the benefits of allocating resources between O&M and other expenditures, or between O&M in one sector versus another. The norms primarily provide a sense of the likely outcome from a specified level of O&M spending (Heller 1991).

Standard cost analysis and expenditure norms

In order to restore O&M funding to more realistic levels, a set of techniques known as standard cost analysis (SCA) have been used in a number of countries (e.g., Ghana, Kenya and Tanzania) for calculating expenditure norms (Bird and Stevens 1991). Expenditure norms provide a standard or a yardstick by which the recurrent

budgetary allocations to a particular program or item can be judged. The basis for this calculation is information on costs related to the activities undertaken. Ideally, this information should be provided by a well-functioning budgeting and accounting system that would provide unit costs of performing various services. Unfortunately, these systems have deteriorated in most countries, and government expenditures have fallen to such low levels that they do not provide any guidance on the adequacy of O&M funding. This problem is compounded where the budget categorization no longer reflects the activities being undertaken. Under these circumstances, an SCA exercise is likely to involve rationalization of budget sub-vote and item classification; and the derivation of expenditure norms relating to this classification using information from other sources. These sources might typically include information from technical departments; information from externally-financed programs and projects; empirical studies of the physical inputs required for a particular activity and of the costs of those inputs; information on running and maintenance costs from manufacturers and suppliers; updating, to current prices, expenditure information from a time when levels of budget provision were considered adequate for the services provided; and international comparison with countries where O&M costs in the public sector are more adequately funded. Collecting and analyzing information from such sources is likely to be a major task and one that has to be undertaken as a separate exercise. In a number of countries, special task forces have been established to determine appropriate expenditure norms. Once calculated, expenditure norms will need to be updated on a regular basis. This will be an on-going task for which long-term strengthening of budget planning and management procedures will often be required.

However, in evaluating O&M norms, it is important to note that norms are related to a certain level of service delivery—i.e., an input-output combination producing outcomes whose net social benefits should be subject to scrutiny. This, in turn, should be based upon program-level evaluation of the inputs (e.g., textbooks) required to accomplish socially desirable outcomes (e.g., improved test achievement scores). Consequently, what constitutes the norm is as much a policy issue as the actual budgetary provision for the service. For instance, one could opt for one or four textbooks per primary school pupil. In recent years, a concerted effort was undertaken in Uganda to calculate expenditure norms (World Bank 1992c). The inputs for the delivery of particular services were calculated (Table 2.7). Estimation of the non-wage recurrent expenditure norm versus actual provision in Uganda implied that a seven-fold increase would be required, although the norm itself was quite modest at only one textbook per subject per pupil (Tables 2.8 and 2.9).

Table 2.7: Uganda: Norms for Core Textbooks and Materials, Primary 1 and 2

Subjects	*Title*	*Quantity*
Mathematics	Primary Maths for Uganda Book 1	1
English	Uganda Primary English Course Term 1 & 2	1
	Uganda Primary English Term 3	1
	Learning to Read by Sound Book 1 & 2	1
	Sound Book 1 & 2	1
	Stationery	
	Exercise books	18
	Pencils	9
	Erasers	3
	Box of crayons	3

Table 2.8: Summary of Non-wage Recurrent Cost Estimates

	U. Sh. billion
Textbooks for pupils	49.6
Stationery for pupils	71.1
Textbooks and guides for teachers	2.1
Stationery for teachers	10.4
Office expenses	1.8
Sports and recreation	1.8
Transport	6.6
Total	144.0

Table 2.9: Actual Provision for Primary Education versus the Norm

	Aggregate (U. Sh. billion)	*Per pupil (U. Sh.)*
FY92 provision	20.1	6,484
Norm	144.0	46,452
Funding gap	123.9	39.968

Source: World Bank (1992c).

Country experience with norms

In Ghana, efforts at standard cost analysis to compute O&M requirements were focused on three sectors: agriculture, education and health. An inventory approach to estimating the requirements of these sectors was first tried before turning to norms. The inventory approach involves taking stock of existing assets and inputs (vehicles, typewriters, textbooks, drugs, etc.). The records were found to be too poor to be of much help. The Government then sought to establish what types and quantities of inputs should be provided for particular programs; that is, to develop norms. A process of trial and error was followed in introducing the norms in Ghana. The most immediate problem encountered in the application of the norms was the lack of systems for determining what was actually spent as opposed to what was allocated. To remedy the situation a concerted effort was made to restore the accounting systems at the Office of the Accountant General. In conception, little attention was paid to the question of whether or not the application of norms would be extended to the entire budget. This has not been done, leading to complaints that the selective application of norms puts the rest of the sectors, or at least other priority sectors, at a disadvantage. These and other concerns aside, the norms have undoubtedly helped to place budget submissions for non-wage recurrent inputs in the three sectors on a more rational basis and with more adequate funding (World Bank 1992c).

Subsidies and Transfers

As with other categories in the economic composition, it is inappropriate to evaluate *subsidies and transfers* as an aggregate expenditure category. There are many different types of subsidies and transfers. For instance, subsidies to households can consist of across-the-board subsidies for particular expenditure categories (e.g., food, housing, health, education), or for targeted programs (e.g., public works program). In addition, transfers can be to public enterprises or to lower levels of government. Each type of subsidy and transfer has a distinct public-private rationale, net benefit and impact on the poor. Consequently, the economic evaluation of each type of subsidy and transfer needs to be carried out separately. For instance, the methodological issues in analyzing the efficiency and equity of across-the-board subsidies or broad targeting (e.g., for basic social services), as opposed to narrow targeting are discussed in some detail in Chapter 7.

Within transfers, the analysis of intergovernmental fiscal transfers constitutes a complex area in its own right which is not within the scope of this paper. Intergovernment transfers are necessitated where expenditure responsibilities for local public goods and services are assigned to lower levels of government, while the bulk of revenues are collected by the central government, thereby necessitating transfers. The literature on intergovernmental fiscal relations provides guidance about the design of transfers to accomplish specific efficiency and equity objectives. For instance, general non-matching transfers or tax base revenue sharing mechanisms are required to deal with a fiscal gap; general non-matching equalization transfers are needed to address differential net fiscal benefits or horizontal fiscal imbalances; open-ended matching transfers are desirable to correct for benefit-spillout compensation, with the matching rate determined by benefit-spillout ratio; conditional non-matching transfers are required to ensure minimum standards of services across the nation; and conditional open-ended matching transfers may be required to stimulate public expenditures on areas of high national importance but low local priority (Shah 1994). This literature also concludes that the structure of intergovernmental transfers is often inappropriate in many countries, ignoring these general principles. For instance, developing countries have numerous specif-purpose grants for which objectives are either not specified or specified vaguely. The literature concludes that simply fine-tuning the existing structure of grants can yield major economic gains, without reassigning expenditure and taxing responsibilities (Ibid.).

Table 2.10: Means of Government Expenditures in Developing Countries by Regions, Average of 1985-89 (economic classification)

Variables	*E. Asia*	*S. Asia*	*S-S. Africa*	*LAC*	*MINA*
Percentage of GDP					
Total expenditure	22.93	23.5	26.03	20.44	29.7
Current expenditure	19.05	16.41	19.93	17.64	23.62
Goods and services	12.35	9.42	13.78	9.62	13.05
Wages	8.08	3.63	7.73	6.26	7.88
Other goods and service	4.2	6.02	5.89	3.74	5.32
Interest payment	2.98	3.5	2.89	3.56	2.72
Subsidy and transfer	3.72	4.98	3.23	3.99	8.03
Capital expenditure	3.83	8.48	5.54	3.0	6.08
Fixed capital	3.03	7.78	4.07	1.82	3.46
Percentage of total expenditure					
Current expenditure	83.42	69.05	77.69	85.96	81.24
Goods and services	53.1	35.71	54.03	50.57	46.32
Wages	33.66	13.06	32.27	33.61	26.28
Other goods and services	19.11	23.27	21.24	16.05	15.21
Interest payment	13.73	12.83	10.75	15.57	9.33
Subsidy and transfer	16.58	19.2	12.83	19.82	26.28
Capital expenditure	16.44	30.85	21.08	14.28	19.07
Fixed capital	12.56	26.67	15.07	8.52	10.51

Source: GFS, local current currency.

3

INTRASECTORAL EXPENDITURE ANALYSIS IN HEALTH

This chapter applies the framework for public expenditure analysis to intrasectoral allocations in health. The approach is illustrative. Consequently, the chapter does not attempt to review the many findings and nuances in the vast literature on health. Rather the objective is to show how a systematic framework can be used to evaluate expenditures within the sector, drawing upon some key lessons and examples in the sectoral literature.

Rationale for government intervention and identification of health programs

As discussed in the preceding chapter, we begin the evaluation of intrasectoral allocations with an identification of key health programs as the principal units of analysis. Key programs can first be identified based upon their rationale for government intervention—i.e., the nature of the underlying market failure and/or poverty alleviation objectives. As further explained below, this suggests that three broad programs in health can be identified: public health, basic clinical care, and specialized tertiary care.

Private markets in health are characterized by a wide range of market failures, which provide an underlying rationale for government intervention in particular areas. Within this, *public health* can be identified as a broad program category, or a set of interventions/expenditures that provide public goods or large externalities. Pure public goods include safe water, sanitation treatment and vector control of infectious and parasitic diseases. These goods are nonexcludable, in the sense that nonpayers cannot be excluded from benefiting from the service. Consequently, private suppliers will undersupply them, or not supply them at all. These constitute the core responsibilities of government in health. In addition, public health programs can include activities with large externalities, where the individual's incentive to seek care or prevention does not take into account the larger social benefits from transmission of disease. Tuberculosis and sexually transmitted diseases are clear examples of such conditions. Finally, this program category can contain activities that address the imperfect information of consumers in the undervaluation of preventive health care measures. Immunization services (which can have large externalities), health, nutrition and family planning education services (which are partly public goods due to nonexcludability of information) are all likely to be undersupplied by the market (World Bank 1992b).

More broadly, a set of market failures in health relate to information asymmetry between the provider and the patient concerning the outcomes of intervention. Providers advise patients on the choice of treatment, and when the providers' income is linked to this advice, excessive treatment can result. As consumers seek to insure themselves against the uncertainties surrounding the probability of illness and the cost of care, moral hazard problems create problems for the efficient functioning of insurance markets. In particular, insurance reduces the incentives for individuals to avoid risk and expense by prudent behavior and can create both incentives and opportunities for doctors and hospitals to give patients more care than they need. The implication of the information asymmetry and moral hazard problems are that in unregulated private markets, costs can escalate without appreciable gains to the patient. To address these market failures, governments need to choose

the intervention most appropriate to the particular context. For instance, governments can regulate privately provided health insurance, or mandate alternatives such as social insurance, to ensure widespread coverage and hold down costs (World Bank 1993).

In addition, government provision of clinical services has been advocated and adopted to address these insurance market failures and to alleviate poverty (World Bank 1993). Within this, *basic clinical services* (e.g., treatment of infection and pain, prenatal and delivery care) can be distinguished from *specialized, tertiary care* (e.g., advanced intensive care), because of the distinct nature and incidence of benefits they provide. Universal provision of free or subsidized package of essential clinical services has often been advocated both on poverty alleviation grounds (to increase the human capital and productivity of the poor) as well as on grounds of addressing insurance market problems that would exclude high risk, needy patients. This, for instance, has been the recommendation of *The World Development Report 1993* (WDR 1993 hereafter). However, as discussed above, if the objective is to address insurance market failures, it needs to be assessed whether regulation may be in fact more cost-effective than universal provision. In addition, as further discussed below, clinical services (unlike public health) are actively and extensively provided by the private sector in developing countries. Consequently, the net impact on private sector supply would need to be taken into account. Moreover, it needs to be ascertained if this is a cost-effective and appropriate service for targeting the poor. Finally, the costs of providing the clinical package would imply significantly increasing total public spending on health in many low-income countries, and would therefore suggest assessing relative returns to these expenditures vis-a-vis other intersectoral reallocations.

The principal implications of the above for intrasectoral expenditure analysis in health are that there is a much more compelling justification for public financing and provision of public health programs that cannot be provided by the private sector than for clinical services. For the latter, their costs and benefits need to be evaluated, taking into account their impact on private supply and the equity objectives they are designed to address.

Relative allocations across health programs

Given the above, it is first useful to attempt to piece together relative allocations of public expenditures across programs. However, getting the data on program level expenditures for health can be quite difficult in practice. This reflects the fact that the organization of health services and associated budget items do not correspond directly to programs as defined above. In particular, there are two difficulties in developing such a picture for health spending: (i) data may only be available at the level of facilities (e.g., urban hospitals, district hospitals, primary health care clinics), which provide a wide array of disease-specific programs or services; and (ii) state and local governments may spend a significant percentage of expenditures on district hospitals and health centers, and this data may not be readily or easily available. For the former, given that a particular facility with a given professional staff (doctors, health care workers, etc.) provides different health services, it can be difficult to identify spending corresponding to individual programs because of joint cost allocation problems (Over 1991). However, there exist some techniques for attributing these joint costs to particular programs depending upon the time spent on each. Furthermore, expenditures on some programs are likely to be correlated with spending of particular facilities (e.g., specialized, tertiary care in urban hospitals, public health and basic clinical care in primary clinics). For the latter, there is no substitute to collecting the data, although depending upon the scale and cost of data collection required, sample surveys could be carried out.

If expenditure allocations can be attributed to programs as discussed above, a time-series on the program-level composition of health expenditures can be developed. Piecing together the relative allocations among these programs can provide valuable insights. It can show, for instance, the relative dominance of tertiary care spending as opposed to public health spending, and whether this has been getting worse. When combined

with an assessment of the rationale for government intervention and other criteria, these can be used to identify the intrasectoral reallocations that will be efficient and equitable. An example of the intrasectoral allocation of health expenditures is shown in Table 3.1, which shows that curative care absorbs 79 percent of the health budget. In Jordan and Venezuela as well, tertiary care absorbs over 70 percent of total spending. More generally across developing countries, only 25 percent of government spending and often less, is devoted to public health programs.

Table 3.1: Tanzania: Composition of Health Expenditures, FY94

	Percent of sectoral expenditures
Preventive services	14
Curative care	79
o/w: Health centers and dispensaries	(38)
District hospitals	(18)
Referral hospitals	(23)
Other expenditures	7

Source: World Bank (1994d).

Indeed, the trends and international comparisons of relative allocations across programs can be examined. It is important to note, however, that there is no optimal share across time or across countries, and such comparisons by themselves can lead to misleading results. Nevertheless, they can help point out outliers or anomalies that can be examined in more depth based upon public-private roles, health sector outcomes and incidence to evaluate underlying problems in expenditure composition.

Social cost-benefit of health programs

The above leads directly into the second step or criterion in intrasectoral expenditure analysis—i.e., net social benefit from public expenditure across programs. This requires identifying the net impact of different program expenditures on health outcomes, followed by the social cost-benefit valuation of the outcomes and expenditures.

Health outcomes

The profile of outcomes of health programs potentially includes infant, child, maternal mortality rates; life expectancy at birth; burden of disease, including disability-adjusted-life-years (DALY) lost by cause; incidence of severe diseases (including preventable diseases); and incidence of disease and access to health facilities by the poor. It is useful to develop a profile of health outcomes or indicators and what has been happening to these over time. Of particular concern for expenditure analysis would be outcomes indicative of serious public health problems (e.g., incidence or resurgence of preventable diseases), given the core role of the government in this area. It is important to underscore that these do not provide a *prima facie* justification for any particular public spending program. This would depend upon what can be done at the margin to address these problems through public interventions, the costs of these interventions, and the benefits that individuals and society attach to these outcomes. Nevertheless, a picture of health indicators, including some international comparisons with countries in the region with similar per capita income, can point to egregious problems or anomalies. Intrasectoral analysis, followed by intersectoral analysis, can help assess whether expenditure reallocations will address these problems, and whether this will be socially desirable relative to the outcomes of other expenditures within and across sectors. For instance, recent PERs for Tanzania (World Bank 1994d) and Uganda (World Bank 1991b) point to a public health crisis in each country, with a resurgence of preventable diseases accounting for rising mortality and morbidity.

With an overall picture of health outcomes as well as government objectives for key outcomes (e.g., targeted reductions in infant and maternal mortality), the question then becomes how do alternative program expenditures affect health outcomes. Establishing the relationship between program expenditures and health outcomes is problematic because health outcomes can be a function of many other factors than mere government expenditures. For instance, Hammer (1993b) points out the difficulties in estimating the outcome from government expenditures on malaria control, given many other influences on health status.

Nevertheless, attempts have been made to measure the impact of health expenditures or inputs on health status or outcomes. Hammer (1993a) has developed an analytical framework to evaluate the net impact of public provision and pricing of health care. A principal finding of that analysis is that *substituting for a well-functioning private sector is not as valuable as providing services that a private sector cannot be expected to generate.* Given people's generally acknowledged undervaluation of preventive services and the public goods characteristics of many such services, the analysis concludes that preventive services (public health) are likely to improve health more than other interventions (e.g., clinical services).

While empirical analysis is relatively limited, some country studies provide evidence to support this conclusion. For instance, econometric analysis of state level panel data for the years 1986-89 for Malaysia suggested that controlling for other factors (e.g., growth in incomes), public health programs such as immunization rates (DPT3) and safe water supply had the strongest and most significant effects on reducing infant and maternal mortality rates Table 3.2. Furthermore, the analysis revealed that while the total number of doctors improves health status, the number of publicly-employed doctors (through government clinical services) does not improve health outcomes, suggesting that public provision may substitute for private doctors with no net beneficial impact. Such results would suggest that if the government seeks to improve health status as measured by infant and maternal mortality, intrasectoral expenditure allocations would need to be restructured towards public health programs and away from clinical services that the private sector can provide (World Bank 1992b).

Table 3.2A: Malaysia: Impact of Health Programs on Health Outcomes

	OLS a/	*Fixed effects*	*IV Random*	*Random* b/	*OLS*	*Fixed effects*	*Randon effects*
Log income	-1.53	-1.03	-.86	-.1.06	-.34	-0.622	.45
	(1.39)	(4.48)	(1.82)	(.97)	(1.56)	(5.26)	(2.13)
Safe water	-.12	-.112	-.127	-.147	-.107	-.102	-116
	(0.38)	(.07)	(.05)	(.06)	(.038)	(.072)	(.06)
DPT3	-.128	-.062	-.071	-.113	-.133	-.063	-.095
	(.024)	(.026)	(.018)	(.04)	(.024)	(.03)	(.02)
Doctors/capita					2.07	2.52	2.07
					(.872)	(4.44)	(1.35)
Public doctors/capita	1.14	.293	1.0	1.03			
	(.53)	(2.4)	(.82)	(.79)			
Adj. R^2	.63	.88	.60	.55	.65	.88	.62

Note: Standard errors are in parentheses.

a/ Ordinary least squares regression.

b/ Regression with instrumental variables.

Source: (World Bank 1992b).

Table 3.2B: Regression Results, Dependent Variable = Infant Mortality

	OLS[a/]	*Fixed*	*Random*
Log income	-.203	.43	.075
	(.103)	(.14)	(.050)
Safe water	-.00018	-.000	-.003
	(.0025)	(.003)	(.002)
DPT3	-.0047	-.0055	-.0042
	(.0017)	(.0018)	(.0024)
Public doctors/Capita	-.019	-.071	.082
	(.045)	(.072	(.057)
Adj. R^2	.33	.47	.34

Note: Standard errors are in parentheses.
a/ Ordinary least squares regression.
Source: World Bank (1992).

In this context, it should be noted that the private sector is a significant supplier of clinical care in developing countries. In Table 3.3, the relative roles of public versus private sector in the provision and financing of health care are shown. Private sector expenditures account for 50 percent of total health expenditures in developing countries, rising as high as 80 percent in India. In low-income countries (e.g., Bangladesh, India, Pakistan and most of sub-Saharan Africa), most of this sum goes for doctors' fees, payments to traditional healers and drugs. NGOs, particularly those related to religious institutions, make important contributions to the health care provision in many low-income countries (e.g., Tanzania, Haiti, Cameroon). In middle-income countries as well, private health provision is significant. However, government services provide care for middle- and low-income groups financed through general revenues, while there is private provision for the affluent financed either through private insurance (e.g., South Africa, Zimbabwe) or social insurance (e.g., Costa Rica, Korea and Turkey).

Benefit valuation of health outcomes

Even given the relationship between health inputs and outcomes, the valuation of these outcomes poses formidable problems in health. The outcomes that health interventions seek to achieve can broadly be grouped under those seeking to reduce *mortality* (death) and *morbidity* (non-fatal disease or illness). The question then centers on how to value reduced mortality and morbidity. This obviously raises very ethically problematic and sensitive issues about how to place a monetary value on life. Economists have tried to get around this by contending that the economic question has not been how to value life *per se*, but how to value small reductions in the risk of death or illness—i.e., the statistical value of life. Both the *human capital approach* and *the willingness to pay approach* have been employed to calculate the statistical value of life.

The human capital approach uses only foregone earnings or productivity on account of death or illness as the appropriate value. Its sole advantage is the relative ease in terms of data requirements, and its focus on income (or output), which can in principle permit comparability with similar measures in education or other sectors. The principal data requirements of this approach are the impact of disease on reduced productivity or output, as well as the valuation of this output. However, strict application of this approach would attribute no value to saving the life of an individual who is unable to work and produce anything of value to the economy. Moreover, by focusing exclusively on foregone earnings, the human capital approach ignores the value the individual places on his/her life or health—i.e., the individual's disutility stemming from pain, fear, suffering or loss of life. Consequently, it is an inaccurate estimation of the true welfare benefits to individuals.

Table 3.3: Public-private Supply in Clinical Health Systems by Income Group

Country group and 1990 per capita income ($US)	Health expenditure, 1990: As share of GNP (percent)	Health expenditure, 1990: Dollars per capita	Characteristics	Examples
Low-income (100-600)[a/]	2-7	2-40	High private spending for traditional medicine and for drugs.	Bangladesh, India, Pakistan, most sub-Saharan Africa
Middle-income (600-7,900) Private insurance	2-7	20-350	Government services for middle- and low-income groups financed from general.	South Africa, Zimbabwe
Social Insurance	3-7	20-400	Public health and clinical care for low-income groups financed from general revenues. Social insurance for wage labor force, with mixed provision	Costa Rica, Republic of Korea, Turkey
Formerly socialist economies of Europe (650-6,000)	3-6	30-200	Public services (which are low in quality or collapsing) financed from general revenues. Large underground market in privately provided services.	Czech Republic, Poland, Slovak Republic, republics of former U.S.S.R.
Established market economies, excluding United States (5,000-34,000)	6-10	400-2,500	Universal or near-universal coverage through general revenue financing or compulsory social insurance. Use of capped third-party payments and global budgets.	France, Germany, Japan (social insurance); Norway, Sweden, United Kingdom (general tax revenues)
United States (22,000)	12	2800	Combination of private voluntary insurance and use of general revenue from taxes. Unregulated and open-ended fee-for-service compensation. High administrative costs associated with health provision and insurance.	United States

a/ Although China is a low-income country, its health system is closer to that of a middle-income country with social insurance.

Source: WDR (1993), p.111.

In light of these limitations, most of the value of life literature has focused on the willingness to pay. It has the distinct advantage over the human capital approach in that not only are the productivity benefits included, but also the direct utility impact is included. Estimates of willingness to pay for reduced risk of mortality and morbidity have relied on two techniques: revealed preference from observed market behavior, and contingent valuation studies. In the *revealed preference approach*, individuals' observed behavior in reducing or taking risks based on market prices are used. Its application in valuing life has centered on the use of *compensating wage differentials* to calculate the premium workers receive in risky occupations. While the advantage of using

compensating wage differentials is that it relies upon observed behavior, there are *difficult and considerable data requirements*. The biggest data difficulties come from: (1) obtaining data on job-related risk of death or injury; and (2) obtaining adequate data on other job characteristics, especially those that may be correlated with risk of accidental death. Moreover, compensating wage differentials is likely to yield significantly biased estimates (i.e., downward), because people in risky professions that these studies concentrate on (typically, blue-collar and/or unionized workers in mining, construction, window-washing, etc.) are likely to be much less risk-averse than the average population. The actual empirical estimates of the value of life emerging from these studies vary widely. Viscusi (1993) reviews 24 principal compensating wage differential studies primarily done in OECD countries, and finds that the majority of estimates are in *US$3 million to US$7 million* range, expressed in December 1990 dollars (see Table 3.4).

To avoid some of the biases and problems in compensating wage differential studies, willingness to pay has also been estimated from *contingent valuation studies*. These studies directly ask individuals through surveys the value they would place on hypothetical reductions of particular risks. In doing so, survey methodologies can provide insight into classes of outcomes that cannot be addressed with available market data, including altruistic benefits. In actual practice, contingent valuation studies have yielded a wide array of estimates both for the value of life and for the value of reduced morbidity; these have ranged from $0.1 million to $15.6 million (see Table 3.5). These cast doubts on the reliability of the estimates resulting from contingent valuation studies—i.e., whether the respondents are providing careful, accurate or truthful answers to the questions. Indeed, answers to hypothetical budgets may be unreliable because the individual is not incurring actual expenses; consequently, he/she may not carefully consider the budgetary implications.

While estimates from labor market studies have been more consistent than contingent valuation studies, there is still too much variance (e.g., $3 million to $7 million) to be used routinely in cost-benefit analysis for health. Viscusi (1993) concludes that for policy purposes, the critical questions should not center on whether the value of life is between $3 million or $4 million—narrow differences that cannot be decided upon based on the accuracy of present studies. Rather, these studies can help decide upon policies where the cost is $50,000 or $50 million. In other words, "it is in addressing the most extreme policy errors that the estimates will be most useful, as opposed to pinpointing the value of life that should guide policy decisions" (Viscusi 1993, p. 1943). However, even for this limited purpose, there are difficulties in applying such estimates for policy decisions in other contexts, particularly developing countries. It would appear inaccurate, methodologically rather than ethically, to use these estimates for developing countries. Moreover, if the total willingness to pay must be bounded by the total lifetime earnings plus wealth, this would imply that the value of life in low income countries would be orders of magnitude lower than these estimates imply for the U.S. even after correcting for purchasing power parity.

Table 3.4: Summary of Labor Market Studies of the Value of Life

Author (Year)	*Sample*	*Risk variable*	*Mean risk*	*Non-fatal risk included?*	*Workers' comp included?*	*Average income level (1990) (U.S.$)*	*Implicit value of life ($ million)*
R. S. Smith (1974)	Industry data: Census of Manufacturers U. S. Census, Employment and Earnings	Bureau of Labor Statistics (BLS)	NA	Yes	No	22,640	7.2
Thaler & Rosen (1976)	Survey of Economic Opportunity	Society of Actuaries	0.001	No	No	27,034	0.8
R. S. Smith (1976)	Current Population Survey (CPS), 1967, 1973	BLS	0.0001	Yes, not signif.	No	NA	4.6
Viscusi (1978a, 1979)	Survey of Working Conditions, 1969-70 (SWC)	BLS, subjective risk of job (SWC)	0.0001	Yes, signif.	No	24,834	4.1
Charles Brown (1980)	National Longitudinal Survey of Young Men	Society of Actuaries	0.002	No	No	NA	1.5
Viscusi (1981)	Panel Study of Income Dynamics, 1976	BLS	0.0001	Yes, signif.	No	17,640	6.5
Craig Olson (1981)	CPS 1978	BLS	0.0001	Yes, signif.	No	NA	5.2
Alan Marin & George Psacharopoulos (1982)	U.K. Office of Population Censuses and Surveys	Occupational Mortality U.K.	0.0001	No	No	11,287	2.8
Richard Arnould & Len Nichols (1983)	U. S. Census	Society of Actuaries	0.001	No	Yes	NA	0.9
Richard Butler (1983)	S.C.Workers' Compensation Data 1940-69	S.C.Workers' Compensation Claims Data	0.00005	No	Yes	NA	1.1
J. Paul Leigh & Roger Folsom (1984)	Panel Study of Income Dynamics, 1974; Quality of Employment Survey (QES) 1977	BLS	0.0001	Yes	No	27,693 28,734	9.7 10.3
V. Kerry Smith and Carol Gilbert (1984)	CPS 1978	BLS	NA	No	No	NA	0.7
Alan Dillingham (1985)	QES 1977	BLS; Constructed by author	0.0000008 0.00014	No	No	20,848	2.5-5.3; 0.9
Leigh (1987)	QES 1977; CPS 1977	BLS	NA	No	No	NA	10.4
Moore & Viscusi (1988a)	Panel Study of Income Dynamics, 1982	BLS, NIOSH National Traumatic Occupational Fatality Survey	0.0005	No	Yes	19,444	2.5, 7.3
Moore & Viscusi (1988b)	QES 1977	BLS, discounted expected life years lost; subjective risk of job (QES)	0.00006	No	Yes	24,249	7.3
John Garen (1988)	Panel Study of Income Dynamics, 1981-82	BLS	NA	Yes	No	NA	13.5
Jean-Michel Cousineau, Robert Lacroix & Anne-Marie Girard (1988)	Labor, Canada Survey, 1979	Quebec Compensation Board	0.00001	No	No	NA	3.6
Viscusi & Moore (1989)	Panel Study of Income Dynamics, 1982	NIOSH National Traumatic Occupational Fatality Survey, Structural Markov Model	0.0001	No	No	19,194	7.8
Moore & Viscusi	Panel Study of Income Dynamics, 1982	NIOSH National Traumatic Occupational Fatality Survey , Structural Life Cycle Model	0.0001	Yes	Yes	19,194	16.2
Moore & Viscusi (1990b)	Panel Study Income Dynamics, 1982	NIOSH National Traumatic Occupational Fatality Survey, Structural Integrated Life Cycle Model	0.0001	Yes	Yes	19,194	16.2
Thomas Kniesner and John Leeth (1991)	Two-digit mgf. data, Japan, 1986	Yearbook of Labor Statistics, Japan	0.00003	Yes	No	34,989	7.6
	Two-digit mfg. data, Australia, by state, 1984-85	Industrial Accident data, Australia	0.0001	Yes	Yes	18,177	3.3
	CPS U.S., 1978	NIOSH (National Traumatic Occupational Fatality Survey)	0.0004	Yes	Yes	26,226	0.6
Henry Herzog & Alan Schlottman (1987)	U. S. Census, 1970	BLS	NA	No	No	NA	9.1
Douglas Gegax, Gerking, and Schulze (1991)	Authors' mail survey, 1984	Worker's assessed fatality risk at work	0.0009	No	No	NA	1.6

Note: All values are in December 1990 dollars.
NA = Not available.
Source: Viscusi (1993).

Table 3.5: Summary of Value of Life Estimates Based on Survey Evidence

Author (Year)	*Nature of risk*	*Survey methodology*	*Average income level*	*Implicit value of life ($ millions)*
Jan Acton (1973)	Improved ambulance service, post-heart attack lives	Willingness to pay question, door-to-door (36) Boston sample	NA	0.1
Jones-Lee (1976)	Airline safety and locational life expectancy risks	Mail survey willingness to accept increased risk, small (30) U.K. sample, 1975	NA	15.6
Gerking, deHaan, & Schulze (1988)	Job fatality risk	Willingness to pay, willingness to accept change in job risk in mail survey, 1984	NA	3.4 willingness to pay, 8.8 willingness to accept
Jones-Lee (1989)	Motor vehicle accidents	Willingness to pay for risk reduction, U.K. survey, 1982	NA	3.8
Viscusi, Magat, & Huber (1991)	Automobile accident risks	Interactive computer program with pairwise auto risk-living cost tradeoffs until indifference achieved, 1987	43771	2.7 (median) 9.7 (mean) (1987)
Ted Miller & Jagadish Guria (1991)	Traffic safety	Series of contingent valuation questions, New Zealand Survey, 1989-90	NA	1.2

Note: All values in December 1990 U.S. dollars.
Source: Viscusi (1993).

Implications for benefit valuation of health programs

All of the above point to the serious and formidable difficulties of applying cost-benefit analysis to health programs. However, all of the above also underscore the imperative for better studies of individual and societal willingness to pay for reduced risks of mortality and morbidity in developing countries. As mentioned earlier, in order to evaluate broad allocations of health spending, it becomes inevitable and inescapable to implicitly or explicitly place a dollar value on life or health. Such an exercise needs to be carried out within and by policymakers and researchers in developing countries themselves. Consistent with the conceptual underpinnings of welfare economics, the value of life must reflect the value that individuals in the developing countries place on their own life and that of their loved ones. Additional adjustments to correct for informational constraints and externalities between health and education can be made through other micro studies. However, contingent valuation and labor market studies for developing countries carried out by policymakers and researchers in those countries themselves become an important priority for research.

Cost-benefit analysis of health projects and programs

In light of the above difficulties, cost-benefit analysis has been rare in the health sector. However, there have been some studies based upon the human capital approach of measuring benefits (Bandyopadhyay and Devarajan 1993). For instance, in evaluating the Onchocerciasis ("Riverblindness") Control Program in eleven Western African countries, Kim (1993) derives a 6.3 percent and 17 percent rates of return using increased labor supply, and increased labor and land supply as benefits respectively; only the direct costs are incorporated in the analysis. Shepard and others (1991) estimate the benefits from the prevention of malaria using avoided costs of treatment and increases in income due to the gain in workdays of the labor force. Bandyopadhyay and Devarajan (1993) use the benefit stream in this study for southern Chad and use assumptions of the costs of malaria prevention to arrive at an estimated rate of return of 159 percent. Finally, Musgrave (1988) evaluated polio eradication in Latin America using as benefits the likely future costs of polio treatment in the absence of the program. Once again, Bandyopadhyay and Devarajan (1993) have calculated rates of return from this analysis; however, these returns vary between 11.5 percent to 221.8 percent depending upon when the benefits are assumed to start accruing and what percent of the future victims are treated.

Cost-effectiveness analysis and the 1993 WDR

In view of the difficulties in assigning a value of life, the most widespread criteria for program selection in health is *cost-effectiveness*. The criterion of cost effectiveness selects projects and programs that minimize the cost of meeting a particular outcome, such as number of lives or healthy life-years saved. For instance, the WDR 1993 has used cost per disability-adjusted life-year (or cost/DALY) as such a cost-effectiveness index to rank interventions. Using this index, the WDR 1993 identifies an essential package of services with low cost/DALY. These include both public health and essential clinical services. Five public health programs are selected in the package as being particularly cost-effective. These include expanded program of immunization; school health program; other public health programs (including family planning, health and nutrition information); tobacco and alcohol program; and AIDS prevention program. The cost-effective essential clinical services selected and recommended by the 1993 WDR include short-course chemotherapy for tuberculosis; management of the sick child; prenatal and delivery care; family planning; treatment of STDs; and a set of "limited care" interventions.

The actual allocation of health care spending in developing countries differs significantly from these recommendations, and the WDR 1993 therefore calls for significant reallocation in the composition of health spending in developing countries. The present actual composition versus the recommended allocation in the WDR 1993 is shown in Table 3.6. In particular, the WDR 1993 concludes that many governments spend far too much on sophisticated hospital services of low cost-effectiveness and too little on essential public health and clinical services. It implies significantly greater spending per capita on public health and the defined minimum essential clinical services, while much fewer spending on discretionary clinical services and tertiary care. For some countries, however, paying for the proposed package of services poses a severe challenge. In fact, in the poorest countries, even if all public expenditure on discretionary services were eliminated, current government spending on health would not meet the costs of the package. This means that either substantial private resources will have to be used, or intersectoral allocations of public expenditure would be needed, or additional donor assistance will be required (WDR 1993). The WDR 1993 recommendations have already been incorporated in a few public expenditure reviews. For instance, the Tanzania PER (World Bank 1993) develops a table of actual health expenditures in Tanzania relative to the WDR 1993 recommendations. Implementing these recommendations would, however, imply that health spending be increased more than five times, thereby squeezing other sectoral expenditures irrespective of any knowledge of their relative benefits. This demonstrates the shortcomings of cost-effectiveness analysis in evaluating broad allocations of public spending.

Table 3.6: Actual Allocations versus WDR (1993) Proposed Allocation of Public Expenditure on Health in Developing Countries, 1990
(dollars per capita)

Package component	*Spending under the proposed package*			*Estimated actual spending, all developing countries*	*Contents*
	Low-income countries	*Middle-income countries*	*All developing countries*		
Public health	4	7	5	1	EPi Plus; school health programs; tobacco and alcohol control; health , nutrition, and family planning information; vector control; STD prevention; monitoring and surveillance
Essential clinical services (minimum package)	8	15	10	4-6	Tuberculosis treatment; management of the sick child; prenatal and delivery case; family planning; STD treatment; treatment of infection and minor trauma; assessment advice, and pain alleviation
Total, public health and minimum essential clinical services	12	22	15	5-7	
Discretionary clinical services	-6	40	6	13-15	All other health services, including low-cost effectiveness treatment of cancer, cardiovascular disease, other chronic conditions, major trauma, and neurological and psychiatric disorders
Total	6	62	21	21	

Source: World Development Report (1993).

Critique of cost-effectiveness analysis

While the use of cost-effectiveness analysis as in the WDR 1993 makes the analysis more tractable, it has some serious shortcomings. The basic problem is that cost-effectiveness is not based on any notion of consumer sovereignty or social welfare, which is fundamentally at odds with the framework for public expenditure analysis as laid out in this paper. For instance, a DALY implicitly embeds all kinds of tradeoffs between various health outcomes that may or may not reflect what any individual wants. A low cost of meeting a particular target ducks the basic question about the desirability, in welfare terms, of the target itself. Consequently, just because a particular intervention is very cost-effective (i.e., has low cost) in terms of adding to another year of healthy life, it does not necessarily follow that the intervention should be undertaken by the public sector or funded. For instance, the activity could be undertaken by the private sector, its total benefits may be valued at less than its cost, and it may not benefit the poor. Indeed, the WDR recommendation for universal provision of clinical services does not take into account the likely impact and crowding out of private provision. Cost-effectiveness analysis is also beset with other important shortcomings (see Hammer 1993b). While cost-effectiveness ratios present a common currency for measuring the impact of health programs and therefore appear to avoid benefit valuation problems, there is in fact an implicit valuation in such cost-effectiveness comparisons, which is not linked to welfare.

In view of these complexities, the paper concludes that it is difficult to value and compare health benefits. The paper suggests establishing the relationship between program expenditures and health outcomes, and then deciding upon the mix of sectoral expenditures-outcomes using social valuation revealed through the political process as well as through sensitivity analysis within reasonable ranges.

Benefit incidence across health programs

Various studies have attempted to estimate the benefit incidence of public spending and subsidies for different health programs in developing countries. These studies have relied on household budget surveys to identify access to different types of facilities by households of different income groups and then to attribute benefits or subsidies to each group. A recent review of these studies in van de Walle and Nead (1995) concludes that while health sector expenditures vary in their incidence according to the level of service, primary health centers dispensing preventive and curative care are usually more pro-poor than hospital services. Indeed, results from a number of studies (Table 3.7) show that public health programs are strongly pro-poor relative to hospital services. For instance, a recent review of 13 country studies indicates that while 50 percent of the subsidies from public health accrue to the bottom 40 percent of the population, only 29 percent of the subsidies to hospitals benefited them. This reflects the fact that unit costs are much higher for urban-based hospital services; the poor have disproportionately less access to these services; and despite low or zero prices, there is a high private cost for the poor to access these services because of travel time and the opportunity cost of waiting time.

Table 3.7: Benefit Incidence of Health Subsidies

		Percentage of government subsidy received by income group		
Country and sector	*Year of survey*	*Lower 40 percent*	*Middle 40 percent*	*Upper 20 percent*
Public health				
Argentina	1980	69	27	4
Chile	1983	51	47	11
Colombia	1974	42	40	20
Costa Rica	1983	49	38	13
Dominican Republic	1984	57	44	9
Uruguay	1983	64	25	12
Indonesia	1978	19	36[a]	45[b]
Iran	1977	51	37	13
Malaysia	1974	47	37	17
Philippines	1975	27	33	40
Sri Lanka	1978	46	39	14
Hospitals				
Indonesia	1974	23	53	23
Malaysia	1974	36	34	20

a/ These figures are for the middle 30 percent.
b/ These figures are for the upper 30 percent.
Source: Adapted from Jimenez (1995).

In this context, while the subsidy for public health appears reasonable, it may be useful to examine the rationale for across-the-board subsidies for curative care as a mechanism for poverty alleviation. From the vantage point of selecting cost-effective instruments for poverty alleviation, it would be useful to select (target) the good or service that minimizes leakages to the nonpoor. In general, this would imply inferior goods or goods with the lowest income elasticity so that it is the poor who are most likely to consume them. As argued by Hammer and Berman, given this criterion health care as a whole would not constitute the best mechanism for targeting, given that it has a relatively high income elasticity of 1.5 (Hammer and Berman 1993). This would

imply that purely as a mechanism to redistribute income, health care subsidization may be expensive and wasteful unless combined with some explicit targeting, either on the basis of service (e.g., public health), personal characteristics, location, etc.

Some implications for intrasectoral expenditure reallocations in health

The above stylized facts suggest that among health sector expenditures, public health programs have a more compelling rationale for public expenditures, provide larger benefits for the poor, and more effectively contribute to improved health outcomes. However, public health programs are grossly underfunded by many governments, even though most governments publicly commit themselves to ambitious targets for improved health status. For instance, while immunization against measles, diphtheria and tetanus has reached 90 percent of the population in some countries such as China, Cuba and Chile, it is still below 50 percent in some Asian and many sub-Saharan African countries. Many of the other key public health programs are also considerably underfunded (e.g., information and prevention of AIDs, safe water). On average, low-income developing countries spend only $1 per capita on public health against an estimated minimum requirement of $4 per capita. Consequently, in many countries, increased allocations towards public health will be efficient and equitable, and contribute to stated targets for reducing infant and maternal mortality rates. Within curative care , governments across developing countries have increasingly pledged themselves to universal provision of basic clinical services, and cost recovery for tertiary care. However, actual expenditure allocations are often orthogonal to these stated priorities because subsidies for tertiary care benefit powerful interest groups such as the urban middle class. For instance, in Jordan and Venezuela, tertiary care absorbs over 70 percent of total spending. More fundamentally, there is a need to assess the relative role of the public versus the private sector in the financing and delivery of (basic and tertiary) clinical care in many countries, including the nature and scope of regulation of private markets by the government.

Analysis of the economic composition of health spending

Turning to the economic composition of health expenditures, some input-mix imbalances tend to be fairly common across developing countries. A key issue is the relative allocations for *recurrent versus capital spending*. A common finding in many countries has been that new capital investments in hospitals and other health facilities have been undertaken, even though recurrent expenditures for existing programs (e.g., basic drugs and supplies for public health programs) are inadequate. The '*r*' coefficient, or the ratio of incremental recurrent expenditure to total capital investment, has been used to quantify the extent of this funding gap in several countries. In Malawi, for instance, a detailed study estimated 0.247 as the 'r' coefficient for health, which implied that the level of incremental recurrent expenditure during 1983/84-1987/88 was only about 25 percent of what would seem adequate to service capital investment undertaken during the period (World Bank 1990). Within recurrent spending as well, there are typically important input mix issues, most significantly the balance between *wage and non-wage O&M* spending in health. In many countries, wage expenditures have grown rapidly, while spending on essential drugs and supplies has been grossly inadequate, with the result that hospitals and health clinics have been built and staffed, but they lack basic drugs and supplies (e.g., Nigeria, Kenya, Uganda). For instance, in Kenya during 1985-88, personnel expenditures on health increased an average of 6.4 percent a year in real terms, while non-wage operating expenditures decreased by 4.4 percent, resulting in shortages of drugs and supplies. In Uganda in the early 1990s, health care workers lacked syringes and gloves even though AIDS was a serious public health problem. Even though the wage bill has often crowded out non-wage O&M, salary levels of health care workers are often found to be too low to provide them the incentives to efficiently and effectively deliver health services, or to attract and retain skilled and trained personnel in the public sector (e.g., Jamaica). For instance, some estimates from Tanzania suggest that health care workers received less than 50 percent of their counterparts in the private sector. Further, while many country studies have found aggregate overstaffing in health (as in other sectors), there is often gross imbalance across programs and facilities, with

overstaffing concentrated in urban hospitals and clinics while there is a shortage of skilled staff and health workers to work on public health programs in remote areas (e.g., Mali).

Unfortunately, the analysis of the economic composition of expenditures in health has not been systematically carried out in many countries, and where it has been analyzed, it has often been done at the sectoral level. However, it is important for such analysis to be disaggregated at the level of key programs identified above. Following from that, the priority in expenditure allocations should be given to essential materials and drugs for public health programs as well as adequate staffing and pay for these programs. For clinical services, it may simply not be feasible for the public sector in many developing countries to keep up with the incomes generated in the private sector if fee for service payments and private insurance markets are allowed to rise without control. In any event, the analysis above would suggest exploring the scope for relying on the private sector for such services, including appropriate regulation of private markets.

4

INTRASECTORAL EXPENDITURE ANALYSIS IN EDUCATION

As with health in the previous chapter, this chapter applies the analytical framework to intrasectoral expenditure analysis in education, drawing upon some key lessons and examples from the sectoral literature. The approach is illustrative, rather than an attempt to capture the many insights and nuances in the vast literature on education.

Rationale for government intervention

As with health, markets in education are prone to a number of market failures that both justify and help identify the type of government intervention in the sector, including key public expenditure programs. The most commonly cited one is the existence of positive social externalities stemming from education, particularly from literacy and numeracy through primary education. Primary education is believed to lead to "good citizenship" and to lessen crime, although it has proven difficult to measure these impacts. There is microeconomic evidence from several countries that education has externalities beyond the individual, although mostly within the family: for instance, education is found to lower fertility, parental education influences children's education, mother's education leads to lower infant mortality, better family nutrition, and improved use of public health facilities (Jimenez 1995). An important source of benefits external to the individual is reflected in the reduced training and search costs imposed on private firms. Although individuals also benefit, the externality stems from the training general rather than specific to particular jobs. Because of this externality, such education will be underprovided by the private sector. The size of the externality generally decreases with the level of education, as higher education has more job-specific benefits realized by the individual (World Bank 1992b).

Capital market failures and imperfect information are cited as another rationale for government intervention. In particular, it is generally difficult to obtain credit for unsecured loans in developing countries, and individuals are unable to borrow against their future lifetime earnings on account of education. However, this need not necessitate government provision of education. The government may have the same or worse information constraint than the private creditor in assessing an individual's earnings on account of education. In any event, addressing these problems would point to financial sector interventions, such as the guarantee or provision of credit for university education, rather than free provision or grants.

The above suggests that lower levels of education, in particular primary education, provide externalities and therefore a more compelling rationale for government intervention and public expenditures. This also suggests that the main programs within education can first be identified based upon their level of instruction—i.e., primary education (basic literacy and numeracy), secondary education and higher education (or tertiary, university education). Given mounting evidence about the significant externalities of female primary education as mentioned above, this could constitute another important unit of analysis, if corresponding data are available.

Relative allocations across education programs

Identifying program-level expenditures poses somewhat less of a problem in education than in health given that programs by and large correspond to facilities (i.e., primary schools, secondary schools, universities). However, the responsibility for lower levels of education still rests with state and local governments in many countries, and consolidating this data can be a difficult challenge.

Given the identification of education programs, the relative allocation of expenditures across programs can provide a useful overall picture of the relative emphasis placed, for instance, on primary versus university education. Trends and international comparisons of expenditure shares can also be analyzed (see Table 4.1). However, as stressed in the case of health, these cannot by themselves be used to identify imbalances. They can nevertheless point to egregious anomalies that need to be investigated in more depth based upon the underlying public-private roles, the net impact on educational outcomes, and the impact on the poor.

Table 4.1: Public Recurrent Expenditure on Education by Level, 1990
(percent)

Region	*Primary*	*Secondary*	*Tertiary*
Low- and middle-income countries	42.9	28.0	19.7
Sub-Saharan Africa (22)	41.3	30.5	14.8
East Asia and the Pacific (4)	49.3	26.8	15.9
Europe and Central Asia (5)	39.4	28.5	18.4
Latin America and the Caribbean (11)	36.0	41.5	16.1
Middle East and North Africa (3)	41.5	30.4	13.9
South Asia (3)	30.7	39.0	20.6
OECD countries (15)			

Note: Unweighted averages, figures in parentheses refer to the number of countries in the regional sample.
Source: Donors to African Education (1994); UNESCO database.

Social cost-benefit across education programs

The above leads directly into the second step or criterion for intrasectoral expenditure analysis—i.e., net social benefit across programs. This requires identifying the net impact of different program expenditures, followed by social cost-benefit based upon the valuation of the outcomes and expenditures.

Education outcomes

Educational outcomes can be measured through indices of educational quantity and quality. The former includes measures of student flows such as *gross enrollment* by level of education, and by different socio-economic groups (e.g., the poor, girls-boys, rural-urban, etc.). Gross enrollment itself constitutes a major challenge in many countries. Worldwide, about 130 million primary school children were not enrolled in school in 1990, of whom 60 percent were girls. In Africa, Asia and the Middle East, the percent of all primary age children that are not enrolled in school are 50 percent, 27 percent and 24 percent respectively. Although *gross enrollment* is important, it is also critical to examine actual *completion rates*, given high *drop out rates* in many countries. Indeed, about 30 percent of the children in developing countries who enroll in primary school do not complete it.

Past these, however, it is important to note that student flows primarily emphasize the *quantity* of education provided rather than the *quality*. This is a principal issue in expenditure analysis for education.

Quality implies emphasizing *learning* by students, and therefore, *cognitive* indices such as *standardized achievement test scores* become important to measure.

Both quantity (and hence access to those uneducated) and quality (learning) are important in developing countries. As in health, these indicators do not provide any prima facie justification for expanding or reducing particular programs—that would depend upon their marginal benefits versus costs. However, trends or international comparisons of these indicators (Table 4.2) can point to egregious anomalies—e.g., across countries with similar levels of economic development—which may reflect underlying expenditure imbalances. For instance, a recent PER on Ethiopia highlights the crisis in primary education by pointing to the 30 percent gross enrollment ratio (among the lowest in the world), which has been declining in recent years. This then leads to a more detailed analysis of underlying intrasectoral and intersectoral expenditure imbalances.

Table 4.2: Enrollment Ratios, Major World Regions
(percentage of school-age population)

Region	*Primary*	*Secondary*	*Higher*
Anglophone Africa	77	17	1.2
Francophone	46	14	2.4
South Asia	71	19	4.4
East Asia and Pacific	87	43	9.1
Latin America	90	44	12.0
Middle East and North Africa	82	36	9.4
Developing Countries	75	23	6.9
Developed Countries	100	80	21.0

Source: Mingat and Tan (1986).

The relationship between program expenditures and educational outcomes

If the principal objectives of the government are to ensure greater access and better quality of basic education, the implication would be to examine allocations for lower levels of education, including the allocations for input mix within these programs as further discussed below. However, the relationship between public expenditures and outcomes is in general a particularly difficult one to establish in the case of education. As further discussed below, the findings in the literature suggest that some of the conventionally accepted wisdom on the importance of particular inputs or expenditures for improved educational outcomes may not be supported by empirical evidence. In particular, this literature suggests that family background may be a principal determinant of educational outcomes, and suggests that certain inputs may have a significant impact whereas others may not.

Even if the precise program expenditure-outcome relationship is difficult to establish, the net impact of different program expenditures needs to be considered *taking into account the role and performance of the private sector*. In this context, it is important to note that there is a significant private sector provision of schooling in developing countries. Typically schools have been provided free or almost free by governments. However, this has not crowded out private supply completely because given fiscal constraints, the government has limited the size of the public school system below full enrollment. Large private sectors have then sprung up to accommodate the excess demand from consumers. Since education yields both public and private benefits and since public policies towards education vary widely across countries, the public-private mix in education provision reveals remarkable heterogeneity across countries.

Table 4.3 shows that in a sample of 12 advanced industrial and 38 developing countries, the percentage of enrollments that are private at the primary and secondary levels cover the entire spectrum from 1 percent to 100 percent. On average, private sector enrollments are similar for primary schools in both developing and developed countries at around 10 percent. However, private sector enrollment for secondary schools is significantly higher in developing countries at an average of 28 percent versus 14 percent in developed countries. This trend is observed despite the fact that private schools in developing countries receive lower subsidies and face fewer regulatory controls because of the excess demand on account of limited public funds (James 1987).

Table 4.3: Relative Role of the Private Sector in Education
(percent)

Advanced industrial societies	*Private primary (1)*	*Private secondary (2)*	*Developing countries*	*Private primary (1)*	*Private secondary (2)*
Australia	20	26	Kenya	1	49
Belgium	51	62	Lesotho	100	89
Denmark	7	6	Sudan	2	13
England & Wales	22	16	Cameroon	43	57
France	15	21	Chad	10	6
Germany	2	9	Liberia	35	43
Italy	8	7	Niger	5	14
Japan	1	15	Nigeria	26	41
Netherlands	69	72	Togo	29	16
New Zealand	10	12	Upper Volta	7	43
Sweden	1	2	Algeria	1	1
United States	10	9	Iran	8	17
			Jordan	30	7
Median	10	13.5	Morocco	5	8
Mean	18	21.4	Saudi Arabia	3	2
			Syria	5	6
			Argentina	17	45
			Bolivia	9	24
			Brazil	13	25
			Chile	18	23
			Colombia	15	38
			Costa Rica	4	6
			Ecuador	17	30
			El Salvador	6	47
			Guatemala	14	43
			Haiti	42	76
			Honduras	5	51
			Jamaica	5	76
			Mexico	6	25
			Panama	5	14
			Paraguay	13	37
			Peru	13	37
			Venezuela	13	17
			India	25	52
			Indonesia	13	60
			Philippines	5	38
			Singapore	11	32
			Thailand	11	32
			Median	11	27.5
			Mean	16.1	31.3

Source: James (1991)

There are few studies on the relative quality of public versus private instruction in developing countries, but those that exist conclude that private sector students—even after controlling for personal background—generally perform better. Moreover, costs per student have generally been found to be lower in the private sector. As Jimenez and Lockheed (1991) have concluded from a review of various studies (see Table 4.4), private schools not only have lower unit costs on average than public schools (due to lower wage bills) but they are also more effective. These findings suggest that government financing of education may need to build upon and encourage, rather than substitute, the private provision of education. However, private schools *per se* are not necessarily or always more effective than public ones. In Tamil Nadu (India), government-aided schools were more cost-effective than fully private unaided schools, and the answer lay in better school management rather than in its publicness *per se*.

Table 4.4: Relative Average Cost and Efficiency of Public and Private Schools

Country	*Ratio of relative effectiveness*	*Ratio of private cost to public cost*	*Ratio of relative cost to effectiveness*
Columbia	1.13	0.69	0.61
Dominican Republic			
O-type	1.31	0.65	0.50
F-type	1.47	1.46	0.99
Philippines			
Math	1.00	0.83	0.83
English	1.18	0.83	0.70
Filipino	1.02	0.83	0.82
Tanzania	1.16	0.69	0.59
Thailand	2.63	0.39	0.15

Source: Jimenez and Lockheed (1991).

Benefit valuation

Given a relationship between inputs and outcomes, the next step is the valuation of these. Typically, the benefits stemming from an education project are taken to be the stream of higher earnings enjoyed by the educated individuals. Two methods have been used to estimate the rates of return (see Psacharapoulos 1993). The *elaborate method* uses detailed age-earnings profiles by level of education to calculate the discount rate that equates a stream of benefits to a stream of costs at a given point in time. The benefit stream, in turn, is typically measured by the earning differential of a graduate of the education level to which the rate of return is calculated, vis-a-vis the earnings of a control groups of graduates of a lower educational level. In calculating private rates of return, the stream of costs consist of the foregone earnings of the individual (as measured by the mean earnings of education at the lower level); in calculating social rates of return, the additional resource cost of schooling is added. The *"basic" earnings function method* involves fitting a semi-log ordinary least squares regression using the natural logarithm of earnings as the dependent variable, and the years of schooling and potential years of labor market experience and its square as independent variables. The coefficient on years of schooling in this regression is interpreted as the average private rate of return to one additional year of education, regardless of the educational level to which this year of schooling refers. However, the coefficients to a year of schooling in this approach is merely the wage effect rather than a rate of return because it does not take into account the costs of education. Moreover, the earnings function method automatically imputes foregone earning capacity even to primary school children, and hence underestimates the average return to schooling.

While these methods provide a mechanism for valuing the benefits from education, there are some serious limitations to these estimates as further discussed below. In particular, there are concerns that in these

calculations, numerous omitted variables (e.g., family background) bias the results. In addition, these estimates typically do not take into account external effects that can be quite significant in education. These concerns notwithstanding, cost-benefit analysis using wage market data as the benefits from education are commonly used to evaluate education spending.

Rates of return across education programs

Using benefit valuation methods as identified above, cost-benefit analysis has been used to estimate the rates of return to different levels of education. Psacharapoulos (1993) reviews a vast range of studies using the elaborate method, and compiles the average rates of return by the level of education across the main regions in the world (see Table 4.5). As this table shows, among the three main levels of education, primary education exhibits the highest social profitability in all world regions. The lowest rate of return is found in higher education in the OECD countries, where it is close to the long term opportunity cost of capital. Moreover, as the Table shows, private returns are considerably higher than social returns because of the public subsidization of education. The degree of public subsidy increases with the level of education, pointing to regressive impact. Finally, since social and private returns decline with the level of per capita income, they point to diminishing returns to the formation of human capital at the margin.

Table 4.5: Returns to Investment in Education by Level, Full Method, Latest Year, Regional Averages
(percent)

	Social			*Private*		
Country	*Prim.*	*Sec.*	*Higher*	*Prim.*	*Sec.*	*Higher*
Sub-Saharan Africa	24.3	18.2	11.2	41.3	26.6	27.8
Asia*	19.9	13.3	11.7	39.0	18.9	19.9
Europe/Middle East/North Africa*	15.5	11.2	10.6	17.4	15.9	21.7
Latin America/Caribbean	17.9	12.8	12.3	26.2	16.8	19.7
OECD	14.4	10.2	8.7	21.7	12.4	12.3
World	18.4	13.1	10.9	29.1	18.1	20.3

*Non-OECD.
Source: Psacharopoulos (1993).

The results from rates of return also reveal that overall, the returns to female education are higher than those of males. However, a more mixed pattern is observed at the individual level of education (see Table 4.6).

Table 4.6: Returns to Education by Gender

Educational level	*Men*	*Women*
Primary	20.1	12.8
Secondary	13.9	18.4
Higher	13.4	12.7
Overall*	11.1	12.4

*Mincerian method.
Source: Psacharopoulos (1993).

In addition, the results indicate that the returns to academic/general secondary school track are higher than the vocational track. The difference between the profitability of the two subjects is more dramatic regarding the social returns because of the much higher unit costs of vocational/technical education (see Table 4.7).

Table 4.7: Returns to Secondary Education by Curriculum Type

	Rate of return	
Curriculum type	*Social*	*Private*
Academic/General	15.5	11.7
Technical/Vocational	10.6	10.5

Source: Psacharopoulos (1993).

Psacharapoulos (1993) concludes with the policy implications of these rates of return studies:

> Primary education continues to be the number one investment priority in developing countries, educating females is marginally more profitable than educating males, the academic secondary school curriculum is a better investment than the technical/vocational track, and the returns to education obey the same rules as investment in conventional capital, i.e., they decline as investment is expanded.

Limitations of rate of return studies

While these rate of return studies have yielded useful insights that have become widely accepted, it is important to keep in mind several limitations of these studies. The critical issue is whether these would negate the policy implications for broad allocations emerging from the studies. A central concern is that the rate of return calculations take into account only private benefits (future earnings of the individual educated), at least some of which can be captured in the private market. Consequently, these studies do not calculate the social rate of return, net of the private market equilibrium. The term "social rate of return" used in these studies is a misnomer, because it does not capture social benefits but only the social costs of government provision of schooling. However, if public provision of schools substitutes for private provision and if the most of the benefits are private benefits, the net return would in fact be less than that suggested by the rate of return calculations. Given the significant provision of secondary schools by the private sector and the less compelling *a priori* indication of social benefits, this substitution effect could be potentially significant. Indeed, if private returns are so high as revealed by the rate of return studies, what is the rationale for public investment? One argument justifying public investment is based on capital market imperfections that prevent individuals from borrowing against future earning capacity. However, is public investment in education (or for that matter, in other sectors that also face capital market imperfections) the right approach?

Another issue with these studies is that there are important *omitted variables*, and hence the inability to identify all the factors that influence earnings. For instance, individuals with a favorable family background may be more likely to receive education, and consequently, the effects of family background may be mistaken for the effects of education (Weale 1992). There have been some innovative attempts to control for family background by considering natural experiments such as differences in the earnings of twins, brothers and father-son group with different levels of education. However, these do not yield conclusive results. For instance, Ashenfelter and Krueger (1992) use data from a survey of identical twins to conclude that each year of school completed increases the wage rate by 16 percent. However, another paper by Ashenfelter (1992) concludes that private returns for father-son and between brothers sample was 5 percent, and that for twins was 7 percent.

Another concern is that the cross-sectional studies contain flaws, such as only emphasizing quantity as opposed to quality as well, which biases the estimates upwards. Behrman and Birdsall (1983) explored this issue for a sample of males in Brazil and found that the private rate of return of 20.5 percent dropped to 11.0 percent when adjusted for quality. In his study of returns to education in Ghana, Glewwe and Jacoby (1992) controls for school quality and family background to conclude that omission of these variables biases results. They conclude that the private rate of return to education in Ghana is at most around 6 percent per annum, and suggests that

rates of return in school quality are needed. An implication of his finding is that other studies of rates of return may provide misleading policy recommendations about educational investment programs (Weale 1992).

Benefit incidence across education programs

Various studies have attempted to estimate the benefit incidence of public spending and subsidies for different levels of education in developing countries. These studies have relied on household budget surveys to identify access to different types of educational facilities by households of different income groups and then to attribute benefits (measured by government subsidies to each facility, or program allocations) to each group. A recent review of these studies in van de Walle and Nead (1995) concludes that while education sector expenditures vary in their incidence according to the level of service, primary and secondary education are usually more pro-poor than university/higher education. For instance, a review of 13 country studies (Table 4.8) indicates that on average, only 10 percent of the subsidies for higher education went to the poorest 40 percent of the population, while 43 percent of subsidies for "all education" accrued to this income group. In Malaysia, for instance, 36 percent of the subsidies for primary education in 1989 accrued to the bottom 20 percent of the population.

Table 4.8: Benefit Incidence of Education Subsidies

		Percentage of government subsidy received by income group		
Country and sector	*Year of survey*	*Lower 40 percent*	*Middle 40 percent*	*Upper 20 percent*
All education				
Argentina	1983	48	35	17
Chile	1983	48	34	17
Colombia	1974	40	39	21
Costa Rica	1983	42	38	20
Dominican Republic	1976-77	24	43	14
Uruguay	1983	52	34	14
Indonesia	1978	46	25[a]	29[a]
Malaysia	1974	41	41	18
Higher education				
Argentina	1983	17	45	38
Chile	1983	12	34	54
Colombia	1974	6	35	60
Costa Rica	1983	17	41	42
Dominican Republic	1976-77	2	22	76
Uruguay	1980	14	52	34
Indonesia	1978	7	10[a]	83[a]
Malaysia	1974	10	38	52

a/ These figures are for the middle 30 percent.
Source: Adapted from Jimenez (1995).

Pricing and cost recovery for education services

Efficiency considerations suggest that pricing be based upon incremental opportunity cost of resources, taking into account externalities (e.g., positive externalities from primary and lower secondary education) and incomplete credit markets. Equity considerations suggest that services consumed more by the poor be subsidized relative to those consumed by the rich. While systematic evidence is not available, country-specific evidence suggests that the most popular pricing scheme, at least officially, is zero or close-to-zero pricing (World Bank, 1986 in Jimenez). Table 4.9 shows the very low prices for education across primary, secondary and higher education. Efficiency and equity considerations would however generally imply significantly enhanced cost recovery for higher education and secondary education.

Table 4.9: Cost-recovery Ratios in Education in Developing Countries, Early 1980s

	Percent of countries with no fees	*Uses fees as percent of unit cost*	*Number of countries*
Education			
Primary	39	8	36
Secondary	25	15	36
Higher	30	8	30

Source: Jimenez (1995).

Actual expenditure allocations across programs

The above stylized facts from international experience suggest that investment in basic education (primary and lower secondary) is likely to be more efficient and equitable than investment in higher education. Consequently, basic education ought usually to be a priority for public spending on education in those countries that have yet to achieve near-universal enrollment at these levels (see Table 4.10 for list of countries with relatively low enrollment in primary education). Indeed, on average developing countries have done so with the highest share of public spending on education being devoted to primary education (35-45 percent), followed by the secondary (25-35 percent) and tertiary (15-25 percent) levels (World Bank 1995c). In all regions except South Asia, moreover, the share of public education spending going to secondary education has increased during the 1980s, reflecting growing enrollments and the near achievement of universal primary education in several regions (*Ibid.*). However, few regions except Europe and Central Asia and some countries in East Asia and the Middle East have achieved near-universal secondary education. Hence the increasing share of public spending going to higher education during the 1980s in regions without high primary and secondary enrollment is likely to be inefficient and inequitable (World Bank 1995c).

Even though spending per higher education student fell as a proportion of spending per primary student in all regions, the levels of subsidization of higher education are still very high (see Table 4.11). The subsidization of higher education is most acute in Africa, where public spending per student in higher education is about 44 times spending per student in primary schools. An extreme case was found in Tanzania with a ratio of 238:1 (World Bank 1994d). The share of tertiary education in public spending on education is higher in Africa than in any other region, at the same level as in OECD countries (World Bank 1995c). Even in other regions, the imbalance towards higher education is quite acute in particular countries. In Brazil, for instance, the public spending per university student (where students pay no tuition) is as high as $6,000 annually (implying a total cost of close to 1 billion per year).

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Table 4.10: Countries with Primary Gross Enrollment Ratio Below 50 and 90 Percent, 1990

Region	*Country*	*Gross enrollment ratio below 50 percent*	*Gross enrollment ratio between 50 and 90 percent*
Sub-Saharan Africa	Benin		67
	Burundi		73
	Burkina Faso	37	
	Central African Republic		68
	Chad		64
	Comoros		75
	Côte d'Ivoire		69
	Djibouti	44	
	Ethiopia	39	
	Gambia		64
	Ghana		77
	Guinea	37	
	Guinea-Bissau		60
	Liberia	30	
	Malawi		66
	Mali	24	
	Mauritania		51
	Mozambique		64
	Niger	29	
	Nigeria		72
	Rwanda		71
	Senegal		58
	Sierra Leone	48	
	Somalia	10	
	Sudan		50
	Tanzania		69
	Uganda		80
	Zaire		76
East Asia and Pacific	Papua New Guinea		72
Middle East and North Africa	Former Dem. Yemen		88
	Former Yemen Arab Rep.		76
	Morocco		65
	Saudi Arabia		77
Latin America and Caribbean	Bolivia		85
	El Salvador		79
	Guatemala		79
	Haiti		56
South Asia	Afghanistan	24	
	Bangladesh		77
	Bhutan	25	
	Nepal		82
	Pakistan	42	

Source: World Bank (1995c), p.39.

Table 4.11: Public Spending per Student: Higher Education as a Multiple of Primary Education, 1980-90

Region	*1980*	*1990*
AFR (8)	65.3	44.1
EAP and SAS (4)	30.8	14.1
LAC (4)	8.0	7.4
MNA (2)	14.6	8.2
OECD (15)	3.0	2.5

Note: Unweighted averages; figures in parentheses refer to number of countries in regional sample.
Source: World Bank (1995c), p.58.

Analyzing economic composition of education expenditures

An analysis of the economic composition of education expenditures requires understanding the relationship between expenditure categories—such as teacher salaries, teacher education, textbooks, facilities—and educational outcomes, as well as valuation of the two. This, however, first requires knowledge of the underlying production function, which is quite complex in the case of education. In particular, what characteristics of inputs—schools and teachers—contribute to the academic achievement of students measured during schooling?

The original, seminal work in this area that triggered an entire controversy came from the Coleman Report for the U.S. (*Equality of Educational Opportunity*). Its main conclusion, at least the way it was interpreted, was that schools are not very important in determining student achievement. Family background, and to a lesser extent, peers were seen to be the primary determinants of variations in performance. Clearly, these findings were very controversial, and led to large research effort devoted to analyzing the determinants of school performance. Harbison and Hanushek (1992) summarize the results of 187 studies of educational production functions in the United States. They conclude that the results are startlingly consistent: no compelling evidence emerges that teacher-pupil ratios, teacher education, or teacher experience have the expected positive effects on student achievement. Other inputs such as facilities, administrators, teacher salaries and expenditures per student also do not reveal a significant relationship with achievement. This leads to the striking conclusion based on the U.S. studies that after controlling for family background and other inputs, differences in educational expenditures are not systematically related to student performance (Harbison and Hanushek, p. 20). Indeed, among the most important conclusions that emerge is that family background is very important in explaining school achievement.

The results of educational production functions in developing countries can be expected to be very different because of dramatic differences in the level of educational support provided in developing countries. A summary of 96 studies for developing countries (Table 4.12) is used to evaluate whether this is in fact so. In interpreting these results, Harbison and Hanushek (1992) count the number of studies with positive, negative and statistically insignificant results, and argue that if a large number of studies were statistically insignificant relative to the number that were positive, there is no strong evidence that the input is valuable. Based upon this, they conclude that the evidence does not provide support for policies to reduce class size: only 8 out of 30 studies find support for smaller classes. Regarding teacher experience, although 35 percent of the studies display significant positive benefits from more teaching experiences, the majority of estimated coefficients are statistically insignificant. For teacher education, a majority of the studies (35 out of 63) support the conventional wisdom that providing education to teachers is valuable. Teacher salaries are not found to be systematically related to better outcomes; however, given the aggregation across countries with different labor market conditions, etc., this result must be interpreted with particular caution. Facilities are another input where there is strong relationship (and stronger than that found in the U.S.) with outcomes; 22 of 34 studies found a strong and positive relationship. Finally, the provision of textbooks and writing materials constitute another input with widespread endorsement and reasonable consistency across studies.

Table 4.12: Summary of Estimated Expenditure Parameter Coefficients from Ninety-six Studies of Educational Production Functions: Developing Countries

		Statistically significant		
Input	*Number of studies*	+	(-)	*Statistically insignificant*
Teacher/pupil ratio	30	8	8	14
Teacher education	62	35	2	26
Teacher experience	46	16	2	28
Teacher salary	13	4	2	7
Expenditure per pupil	12	6	0	6
Facilities	34	22	3	9

Source: Harbison and Hanushek (1992).

Based on the overall evidence, Harbison and Hanushek conclude that the reason a number of inputs (e.g., class size or teacher salaries) do not reveal the expected relationship with achievement possibly reflects problems in the current institutional structure. In other words, they do not question that money spent on these inputs *could* count—it just does not systematically do so given the current organization of schools.

In reviewing the Harbison and Hanushek results, Kremer (1995) argues that it is inappropriate to weight all studies equally in analyzing statistical significance, given differences in the number of observations, procedures and controls. Indeed, when the probabilities of finding positive, negative and insignificant coefficients are taken into account for each of the studies in Table 4.11, Kremer finds that all inputs, aside from teacher-pupil ratios, have positive effects. He concludes that even though inputs may not systematically improve school performance, the policy decision should be based upon average impacts that are positive.

The controversy about interpretation notwithstanding, there appears to be consensus that while class size and teacher-pupil ratios may not be significant, the *quality of facilities*, *teacher education* and the *availability of textbooks* are quite important in enhancing learning in developing countries. It is instructive to keep these general lessons from international experience in mind when analyzing the economic composition of education expenditures.

In terms of actual expenditure allocations in developing countries, the nature of imbalances across expenditure categories tends to vary by levels of education. In primary education, the principal input-mix problem is the wage/non-wage expenditure imbalance. In secondary and university education boarding costs and student welfare education acquire much greater importance. In Tanzania, for instance, *boarding costs and student welfare expenditures* accounted for as much as half of total expenditures in secondary schools (see Table 4.13), while school materials accounted for only a meager 5 percent.

Table 4.13: Tanzania Expenditure Allocation Across Inputs in Education, 1991-92
(percentage share)

	Primary education	*Secondary education*	*University education*
Personal emoluments	81	23	35
Staff training, travel, visits	3	8	10
Students boarding/welfare	4	49	34
Materials	5	5	9
O & M	0	14	10[a]
Other	7	1	2
Total Inputs	100	100	100

a/ Includes fringe benefits for staff and students.
Source: World Bank (1994), p.33.

As mentioned earlier, a key problem is the *wage/non-wage expenditure imbalance*. In Bolivia, during the period 1980-87, teacher salaries for non-university education accounted for between 98.1 percent to 99 percent of sectoral expenditures, leaving virtually nothing for non-wage O&M. A time-series of the ratio of personnel to non-personnel recurrent expenditures in education in Côte d'Ivoire reveals that the ratio jumped from 1.42 in 1976 to 10.82 in 1988.

Going further below, these expenditures can provide an indication of the resources left for meeting minimum physical input-output coefficients. For instance, in Kenya, teacher salaries for primary education grew rapidly to account for close to 90 percent of total spending, while non-wage expenditures dropped sharply amounting to less than the price of one textbook per student per year. In Tanzania, it has been estimated that the 1992-93 expenditures would be sufficient to cover only one-third of the norm for school materials (World Bank 1994d). Other physical input ratios frequently used are student-teacher (or class size) ratios, student-school ratios, student-class ratio, etc. to show the under- or overprovision of particular inputs relative to sector norms deemed essential to provide good quality of instruction to students (see for instance Ethiopia PER 1993). One common finding is the low student-teacher ratios in universities and very high ratios in primary education. However, the earlier evidence on education production functions would urge caution in the use of such norms as class-size does not appear to be significant for raising educational quality.

5

EXPENDITURE ANALYSIS IN INFRASTRUCTURE AND AGRICULTURE: SOME EXAMPLES

This chapter illustrates the application of the framework for expenditure analysis to economic infrastructure and agriculture, primarily through some examples. It is divided into three sections. The first reviews the diversity within economic infrastructure, and points out how recent innovations in technology and public-private roles have diminished the role for public investments in subsectors such as telecommunications and power. The second section then focuses on road transport to demonstrate, primarily through country example, how intrasectoral allocations can be analyzed in the sector. Finally, the third section shows how the framework can be applied to intrasectoral expenditure analysis in agriculture, using an example from India.

Public-private roles in economic infrastructure

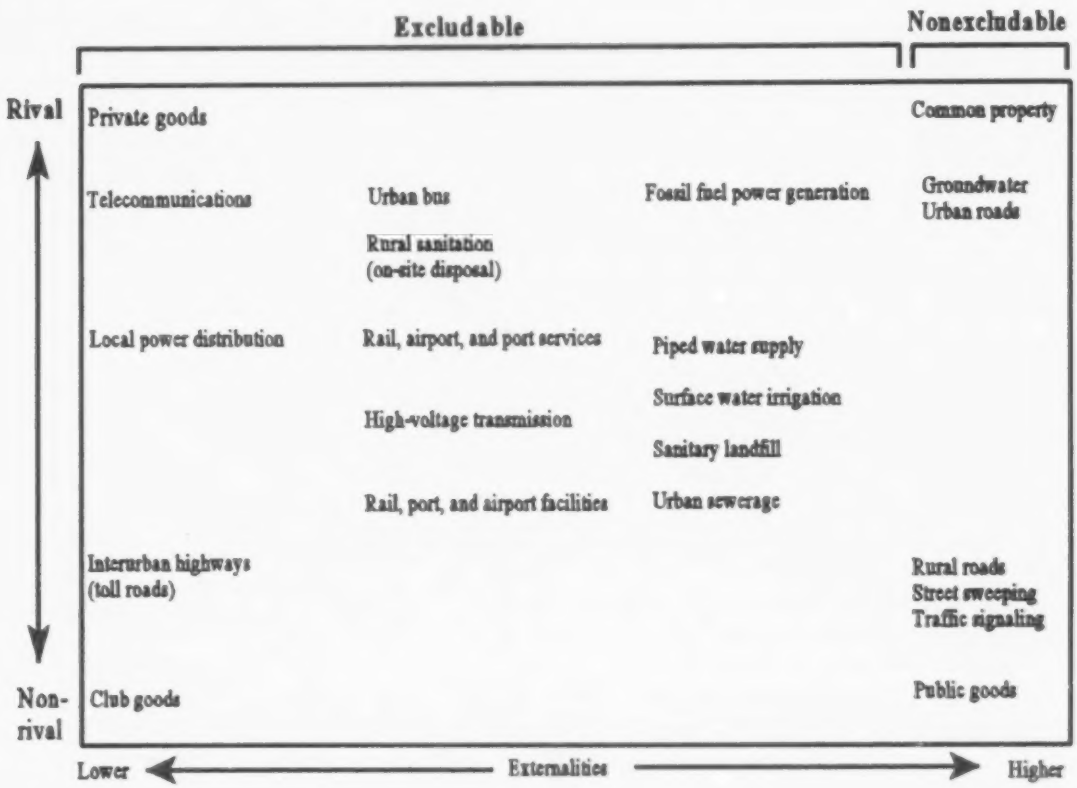
Economic infrastructure covers a wide array of services. It includes public utilities such as power and telecommunications, public works such as roads, and other transport services such as railways and ports. Taken together, the value added of services delivered through the use of infrastructure account for about 7 to 11 percent of GDP. Within this, transport constitutes the largest sector in developing countries. A sample of developing countries shows that infrastructure typically represents about 20 percent of total investment and 40 to 60 percent of public investment.

The diversity within economic infrastructure suggests that its constituent sectors and programs will have distinct public-private rationales, net benefits and impact on the poor. Application of the first criteria for expenditure choice suggests that the nature of underlying market failure and the associated rationale for public expenditures varies considerably across infrastructure subsectors. As shown in Figure 5.1, most of the services that infrastructure sectors produce are excludable in a specific sense—their use depends upon gaining access to a facility or network, for example by connection to a piped water, gas or sewer system, and service use may be metered and charged for. In the case of railways, ports and airports, access to the entire infrastructure can be restricted. However, once a user is connected to the facility or network, the degree of rivalry with other users depends upon the costs (including congestion) imposed on existing users or on the service supplier when an additional service unit is consumed. It has been common in many countries not to charge users for the volume of some utility services consumed because the marginal supply cost was assumed to be negligible, congestion was absent, and technological constraints prevented volume pricing. However, recent developments, such as the increased scarcity of water, congestion of network capacity, and technical innovation in metering consumption, have made it possible and desirable to price some of these services like private goods (World Bank 1994d).

More broadly, the feasibility for private sector provision will vary by infrastructure sector and program, and requires that infrastructure services be unbundled to assess their potential for marketability. The "marketability" of infrastructure activities can be determined by the following activities: production technology that leads to natural monopoly; the public nature of consumption; constraints on cost recovery; distributional concerns; and the importance of spillover effects. Based upon this, the WDR 1994 illustrates the differences, both within and between sectors, in the marketability of infrastructure services (Table 5.1). The exercise suggests

that the potential for commercialization and competition in infrastructure is more widespread than is commonly supposed.

Figure 5.1 Public-private Rationale Across Infrastructure Subsectors



Note: Excludable means that a user can be prevented from consuming the good or service. Rival means that consumption by one user reduces the supply available to other users.
Source: WDR (1994), p. 25.

As against the above, the public sector has traditionally had a dominant role in the financing and delivery of all infrastructure services in developing countries. Yet, the nature of market failures and the associated rationale for public expenditures are not compelling any more in some infrastructure sectors because of new technology and changes in regulatory management of markets.

Indeed, changes in technology in *telecommunications* and *power* have created new scope for competition and private sector participation. In particular, technology is creating new scope for competition and weakening scale economies in many infrastructure sectors that constituted a significant rationale for publicly-owned and financed national monopolies. In telecommunications, satellite and microwave systems have replaced long-distance wire networks, and cellular systems are threatening to replace local distribution networks. These two changes are removing the network-based monopoly in telecommunications and making competition possible. In power generation, combined-cycle gas turbine generators operate efficiently at lower output levels,

cogeneration of power using heat from industrial sources is often cost-effective, and renewable energy sources (such as micro-hydro and photovoltaic systems) are lowering costs (WDR 1994).

Table 5.1: Feasibility of Private Sector Delivery Varies by Infrastructure Components

	Key to marketability rating: □ *=1.0 (least marketable)* ▒ *= 2.0* ■ *= 3.0 (most marketable)*	*Potential for competition*[a]	*Characteristics of goods or service*	*Potential for cost recovery from user charges*	*Public service obligations (equity concerns)*	*Environmental externalities*	*Marketability index*[b]
Telecom	Local services	Medium	Private	High	Medium	Low	2.6
	Long distance and value-added	High	Private	High	Few	Low	3.0
Power/gas	Thermal generation	High	Private	High	Few	High	2.6
	Transmission	Low	Club	High	Few	Low	2.4
	Distribution	Medium	Private	High	Many	Low	2.4
	Gas production, transmission	High	Private	High	Few	Low	3.0
Transport	Railbed and stations	Low	Club	High	Medium	Medium	2.0
	Rail freight and passenger services	High	Private	High	Medium	Medium	2.6
	Urban bus	High	Private	High	Many	Medium	2.4
	Urban rail	High	Private	Medium	Medium	Medium	2.4
	Rural roads	Low	Public	Low	Many	High	1.0
	Primary and secondary roads	Medium	Club	Medium	Few	Low	2.4
	Urban roads	Low	Common property	Medium	Few	High	1.8
	Port and airport facilities	Low	Club	High	Few	High	2.0
	Port and airport services[c]	High	Private	High	Few	High	2.6
Water	Urban piped network	Medium	Private	High	Many	High	2.0
	Nonpiped systems	High	Private	High	Medium	High	2.4
Sanitation	Piped sewerage and treatment	Low	Club	Medium	Few	High	1.8
	Condominium sewerage	Medium	Club	High	Medium	High	2.0
	On-site disposal	High	Private	High	Medium	High	2.4
Water	Collection	High	Private	Medium	Few	Low	2.8
	Sanitary disposal	Medium	Common property	Medium	Few	High	2.0
Irrigation	Primary and secondary networks	Low	Club	Low	Medium	High	1.4
	Tertiary (on-farm)	Medium	Private	High	Medium	Medium	2.4

a. Due to either absence of scale economies or sunk costs, or existence of service substitutes.

b. Marketability index is average of ratings across each row.

c. Including cargo handling, shipping, and airlines.

Source: WDR (1994), p. 115.

These changes, together with the dismal performance of public infrastructure services and a general re-evaluation of the role of the state, are stimulating a much greater role for competition and private sector participation in these subsectors. Most dramatic have been privatizations of the telephone system in Mexico and the power system in Chile. In several other countries, various forms of public-private partnerships have evolved (e.g., the leasing of port facilities to private operators in Malaysia). Where there can be competition among service suppliers, private ownership and operation require little or no economic regulation beyond that applied to all private firms. For instance, 27 developing countries allow cellular telephone service to be competitively provided, and many others allow private firms to construct electricity-generating plants and sell power to the national grid. However, where systems are being fully or partially privatized and there is no cross-sectoral competition, regulation of both private and public providers is required to prevent abuse of monopoly power.

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Private financing of new infrastructure investments is growing rapidly across developing countries through build-operate-transfer (BOT) arrangements under which private firms construct an infrastructure facility and then operate it under franchise for a period of years on behalf of the public sector. This approach has been used to finance power-generating plants in China and the Philippines (WDR 1994). Although private financing of infrastructure at present accounts for only 7 percent of total infrastructure, its share is expected to double over the next five years. Consequently, while the role of government will undoubtedly continue to be important in subsectors such as telecommunications and power, there is likely to be a significant shift to private financing and provision with concomitant regulation by the public sector, and there is likely to be diminished relative importance of public investments in these subsectors.

Intrasectoral expenditure analysis in roads

Within economic infrastructure, there is likely to continue to be a continuing, strong rationale for public expenditures in the road sector. This section therefore focuses on illustrating the application of the general framework to the road sector.

Public-private roles and identification of programs

Applying the framework of expenditure choice to the road sector suggests that major road types or programs can first be identified based upon the nature of the underlying market failure. Rural and uncongested interurban roads are typically nonexcludable as well as nonrival because adding another driver does not reduce the value to someone else. These therefore constitute public goods with a strong rationale for public provision. However, access to some interurban roads can be prevented by making them toll roads (i.e., "club goods," which are excludable but nonrival), which can then in principle be built and operated by the private sector. By contrast, urban roads are congested during peak hours, but until recently it has been difficult to exclude users from urban roads or to charge users different amounts during peak and off-peak periods. New electronic techniques of monitoring road use may ultimately make it technically feasible to treat many urban roads as private goods. The vast bulk of roads, however, will continue to be public goods in most developing countries, and that therefore brings up the second criteria of cost-benefit analysis for choosing among alternative road investments.

Road sector outcome indicators

The road transport sector has a rich and detailed literature on outcome/performance indicators of road expenditures (Humplick and Paterson 1994). This includes, among other things, indicators of infrastructure size and condition as well as indicators of service quality and reliability from a user's point of view (see Tables 5.2 and 5.3). A road performance indicator could therefore be developed to provide an overall picture based upon, for instance, the size of the road network, its density, its connectivity, its condition by surface type (paved, gravel, earth), its engineering rating by vehicle operating cost (good, fair, bad), and by type of terrain (flat, rolling, mountainous).

Unit costs and physical input-output norms

There are a variety of carefully determined unit costs and physical input output norms in roads, which depend upon the terrain, surface type, average daily traffic (ADT), etc. This enables relatively easier identification of unit cost anomalies and input mix imbalances. For instance, in Peru it was determined that unit costs proposed for new construction was four times the recommended norm ($200,000 per km versus $50,000 per km recommended). The relationship between provision of the above inputs and outcomes requires underlying models for estimating traffic volumes and benefits on account of these volumes. The data required are the initial traffic flow based on origin-destination surveys, the type of road, and the vehicle operating costs of alternative modes.

With the proposed expenditure—maintenance or investment—there will be a change in vehicle operating costs, and based on the relative price differential this would lead to net change in traffic flow and vehicle operating costs.

Table 5.2: Indicators of Infrastructure Provision

Aspect	*Indicator*	*Units*	*Notes and some second-level indicators*
Network size	Road length	km	Lengths: by road class, juriadiction, function, technology, (surface type), subsector (interurban, urban, rural).
	Road space	Lane-km	Total and by road category (access-controlled, primary, secondary, tertiary).
	Bridges and tunnels	*m* number	Bridge and tunnel categories.
	Extra-modal links	*m* number	Road-ferry and road-rail lings, etc.
	Road reserve area	ha	
Asset value	Replacement value	$M	Current replacement value by component (roads, structures, furniture, facilities, land area).
Users	Vehicle fleet size	Mveh.	Vehicle fleet, (I) by category, heavy, light; ii) class: articulated trucks, trucks, buses, lights, cars, other motorized.
	Motorization	veh/1000 inhabitants	Licensed drivers (licensees per 100 inhabitants).
Demography and macroeconomy	Total population	inhabitants	
	Area of country	km^2	II: Climate range, topography, etc.
	Urbanization	%	
	Gross National Product	I$M	
Availability	Network density	km/100 km^2	
	Road-space availability	lane-km/M inhab.	
	Road-space sustainability	lane-km/$M(GDP)	
Utilization	Vehicle travel	G.veh-km/yr	Vehicle travel by road class and vehicle class.
	Traffic density	veh/land-day	
	Passenger travel	psg-km/yr	
	Freight travel	tonne-km/yr	

Source: Humplick and Paterson (1994).

Table 5.3: Indicators of Service Quality for Roads and Pavements

Aspect	*Indicator*	*Units*	*Notes and some second-level indicators*
Road surface	Ride and tracking quality	Incidence (% VKT)[A/T/I]	Surface profile measures = {IRI, RDM/RDS, TX2, Vnom}.
	Surface safety adequacy	Incidence (% VKT) [A/T/I]	Skid resistance relative to demand, hydro-planing potential.
Road corridor	Geometric standard	Incidence (% km) [A/T/I]	{Curvature, gradient, width, shoulders, sight distance}.
	Driver guidance	Incidence (% km) [A/T/I]	Road marking, signage, message.
	Collision mitigation	Incidence (% km) [A/T/I]	Barriers, obstacles, distractions.
User safety risk	Fatality risk exposure	Fatalities/100k. veh-km	
	Injury risk exposure	Injuries/100k. veh-km	
	Accident risk exposure	Accidents/100k. veh-km	
Mobility quality	Total vehicle delay	Veh-hrs	{Nominal speed, avg. travel speed, VKT}
	Incidence of congested flow	Incidence (% VKT) [A/T/I]	Ranges of V/C, incidence adjusted for time and length by VKT.
	Average travel speed	km/hr	Average speeds by road class, adjusted by VKT.
Accessibility quality	Link closure incidence	Number link days	Number of days a link is impassable (washout, flooding, blockage, etc.) annually summed overall links.
Road user cost	Average VOC/veh-km	I$/veh-km	[Program total VOC-optimal program total VOC]/total VKT
	Avoidable VOC	I$/veh-km	
Environment	Emission incidence	% km [A/T/U]	Time subject to elevated levels, location of areas.
	Noise incidence	% km [A/T/U]	Time subject to elevated levels, location of areas.

Source: Humplick and Paterson (1994).

Benefit valuation in road transport

The benefits of roads projects consist of the changes in consumers' and producers' surpluses. These are typically measured by calculating vehicle operating cost and user time savings for both passengers and freight. In addition, changes in deaths, injury and property damage from accidents are sometimes quantified and occasionally valued. As in education and health, externalities from road expenditures have not been estimated, although some recently initiated research is beginning to attempt this.

Economic rates of return: evaluation of road link expenditures

Using the above information and data on road condition (and therefore VOC) and traffic volumes, the rates of return to road transport expenditure programs can be calculated. Given data on costs and on the road network as a whole (including the ADTs), it is feasible to calculate the economic rates of return for each road link. To this end, the Bank developed the Highway Design and Maintenance Standard Model (HDM) principally to evaluate road construction and maintenance strategies and their trade-offs, through simulation of total road life-cycle conditions and costs. An example comes from a recent PER for Peru (World Bank 1994c). In that PER, the ERRs were calculated on all the road links. Special emphasis was placed upon those links that had very low levels of ADT (and hence low potential benefits), high unit costs, and new construction works. The results implied that the government could scale back its road investment program by $275 million over the 5-year planning period (see Table 5.4).

Table 5.4: Peru: Economic Rates of Return by Road Links

	Current				For a minimum 12% return	
Name of link	*Length in km*	*Investment (in US$m)*	*ACT*	*ERR %*	*Investment $*	*ADT remarks*
Cajambamba-Cajamarca	123	16.22	54	2.22	8.30	130
Curtervo-Socoto	30	5.75	69	5.92	3.90	110
Socota-Cavico	43	8.95	69	4.84	5.60	120
Huancabamba-Ayabaca	22	2.45	21	3.34	1.25	54 New constr.
Rio Pampas-Andahuaylas	118	24.51	118	5.85	16.50	185
Andahuaylas-Abancay	139	28.68	108	-3.08	8.10	535
Abancay-Limatambo LV	119	24.51	140	3.51	13.80	275
Pte. Paucartambo-DV.P. Bermudez	132	42.13	190	1.57	19.80	440
Tocache-Pts. Pizana	39	7.01	61	-1.51	2.44	235
Juanjul-Tarapoto	134	39.76	260	5.69	26.50	405
Satipo-Mazamari	21	2.00	114	12.72	n.a.	n.a. New constr.
SV. Olmos-Huancabmba	143	30.72	304	21.61	n.a.	n.a.
Pte Balzax-Achamaqul	157	31.86	20	-4.47	7.40	140
Achamaqul-Chachapoyas	14	0.55	36	15.36	n.a.	n.a.
Tarapoto-Yurimaguas	131	13.06	76	11.76	12.80	78
Shorey-Laguna-Sacsacocha	73	25.38	213	1.73	11.90	480
Lag. Sacsacocha-EMP 5N Huayabamba	261	12.45	30	3.99	7.50	112 New constr.
Yanac-EM5N Pt. Huicte	261	73.28	41	-1.05	23.00	160 New oonstr.
Yanahuanca-Pte. Tusi	40	8.18	112	1.56	3.87	270
Huayllay-Cerro de Pasco	41	5.73	100	9.71	5.00	118
Pampano-Rumichaca	120	16.33	77	2.83	8.80	170
LV Apacheta Gde. Ayacycho	98	22.21	100	2.91	11.90	205
Puqui-LV Sol de Oro	114	23.62	77	-1.28	8.40	275
LV Sol de Oro-EM3S Ei Olivio	130	26.83	142	9.95	32.00	163
Abacay-Cuzco	81	36.13	142	1.75	12.80	320
Urcos-Pto. Maldonado	355	58.88	107	14.83	n.a.	n.a.
Yauli-Combapata	114	23.85	70	-1.92	7.80	278
LV-Julia	143	29.70	215	1.34	13.80	530
Total		$640.71				
Total excl.		$548.56				

Notes: 1. Across the board salvage value of 20% was used except for new construction - 30%.
2. ADT has a fixed growth rate of 4% per annum.
3. VOC before and after differs according to the road condition and terrain.
4. Maintenance is assumed to be fixed at $3500/km for before and $1500/km for after scenario.
5. Analysis period of 15 years.

Source: World Bank (1994c).

Impact on the poor

While cost-benefit analysis has been frequently carried out for the road sector, applying the third criteria—impact on the poor—has proven quite difficult in roads because of their public goods characteristics. It becomes difficult to attribute the indirect benefits of roads across income groups, and benefit-incidence has therefore not been carried out as in health or education. However, some methodologies to measure the impact of road expenditures on the poor are only now being employed in new research on countries such as Vietnam and India.

Evaluation of economic composition of road expenditures

Looking to the economic composition of expenditures, a key issue in transport sector expenditures is *road maintenance versus new investment*. Rates of return on road expenditures have generally shown the typically higher returns to maintaining existing road segments than constructing new links. For instance, road maintenance projects supported by The World Bank in recent years had an average return of 45 percent against 24 percent for new construction projects (Table 5.5). Inadequate maintenance imposes large recurrent and capital costs. The engineering and physical characteristics of paved roads are such that, as a road begins to deteriorate, lack of routine maintenance will hasten deterioration. Neglect of relatively inexpensive routine maintenance can compound problems so much that the entire surface of a road has to be replaced. Yet, in sub-Saharan Africa, almost $3 billion worth of roads—one-third of those built in the past twenty years—have eroded because of a lack of maintenance. In Latin America, for every dollar not spent on maintenance, $3 to $4 are estimated to be required for premature reconstruction.

Table 5.5: Average ERRs on Road Maintenance versus New Construction

World Bank supported projects	*Mean ERR*	*Number of observations*
Construction	24.08	49
Maintenance	45.22	30

Intrasectoral expenditure analysis in agriculture: Country example

Using the analytical methodology of this paper, this section presents an evaluation of broad allocations in agriculture using the example from India. The example comes from a paper by Pradhan and Pillai-Essex (1993, referred to as PPE below).[1] The key issues that emerge and the analytical methodology applied—e.g., rank-ordering of irrigation investments versus rehabilitation versus maintenance, the economic viability of crop production schemes and the fertilizer subsidy—have broad relevance to agricultural sector expenditure analysis elsewhere.

Sectoral outcomes and state of affairs

A review of sectoral outcomes and indicators in Indian agriculture revealed several disconcerting aspects: the vast irrigation infrastructure is, on average, performing well below potential, and increasingly falling into disrepair; high agricultural productivity and growth remain concentrated only in particular regions, crops and irrigated lands, yet agricultural extension and research were insufficiently geared toward developing, adapting or disseminating the technology for other regions, crops or for rainfed agriculture; the efficiency of agricultural extension is impaired by inadequate operational expenses for critical items; India's forest reserves, overexploited over the years, run the risk of continuing degradation and deterioration with concomitant adverse implications for biodiversity or the protection of watersheds and fragile soils. At the same time, the fiscal burden on account of the fertilizer subsidy has grown rapidly and is unsustainable under present macroeconomic constraints.

1. It is important to reiterate the general point that this example is provided for illustrative purposes, and does not represent the Bank's official recommendation.

Identification of main programs and public-private roles

In this context, PPE analyzed the composition of public spending in the sector. Based on the nature of benefits conferred by different expenditure categories, the main expenditure programs were identified as: the fertilizer subsidy, centrally sponsored crop production schemes (which subsidize farmers for various crop-specific inputs and technologies), irrigation, agricultural research, agricultural extension and forestry. This was used to develop a functional composition of agricultural sector expenditures as shown in Table 5.6 below. Given the constitutional division of responsibilities, state governments accounted for more of sectoral spending, and within that, irrigation dominated followed by research and extension. Central government spending was dominated by the fertilizer subsidy followed by crop production schemes.

Table 5.6: Functional Composition of Agricultural Expenditure in India, 1990-91

	Percent of sector expenditure
Central government	44
o/w fertilizer subsidy	(60)
Crop production	(10)
Research and extension	(4)
Irrigation	(4)
State governments	56
o/w Irrigation	(60)
Research, extension, forestry	(40)

Source: Pradhan and Pillai-Essex (1993).

Based on the prior evaluation of the *rationale for government intervention* as suggested in the analytical framework, the analysis revealed that both the *fertilizer subsidy* and *crop production schemes* have questionable economic justification. In particular, both seek the provide subsidies for "encouraging" the "adoption" of "new" technologies; yet, each is subsidizing old, well-known inputs or technologies that were introduced 10-20 years ago. Indeed, in states such as Punjab and Haryana where the bulk of subsidies accrue, farmers are well aware of the beneficial effects of fertilizers, hence a subsidy to encourage use has little validity. On the contrary, the subsidy has encouraged uneconomic and indiscriminate use of fertilizers affecting soil conditions and polluting groundwater. In other states, such as Madhya Pradesh or Orissa, where average fertilizer use is low and fresh adoption can be encouraged, the problem is that supporting investments in irrigation, location-specific technology, and related infrastructure are critical preconditions for greater fertilizer application and productivity. This is supported by econometric studies that show that investment in *irrigation* has been the most productive investment for enhancing agricultural production and growth, of greater significance than relative prices on account of fertilizer subsidies. Not only would such expenditures be more efficient, but they would also be more equitable as the low-fertilizer-use states also have a larger percentage of the poor.

Rates of return across agricultural programs

Based upon the project rates of return of new and existing investments, PPE calculated and compared the rates of return across agricultural programs. The results are summarized in Table 5.7.

The results show that programs within irrigation have very different rates of return. Support for private groundwater irrigation appeared to have the highest rate of return, followed by maintenance of existing systems. New investment in surface irrigation proved not to be as socially profitable. Agricultural research appeared to have very high ex-post rates of return in India, as did agricultural extension projects. Moreover, particular types of forestry projects showed high returns.

PPE also analyzed the *economic composition* of program expenditures, and found that for agricultural extension, basic non-wage operational expenses were grossly underfunded (based on physical norms) that considerably undermined the efficiency and mobility of extension workers. The economic composition of non-wage operations and maintenance expenditures in irrigation revealed that allocations were less than 10 percent of the minimum recommended physical input norms.

Table 5.7: Rates of Return Across Agricultural Programs
(economic rates of return)

	Percent
Fertilizer subsidy	0*
Crop production schemes	0*
Irrigation	
O&M expenditures	29-40
Support for government irrigation	38
New surface irrigation	5-10
Agricultural research	40
Agricultural extension	50
Forestry projects	
Regeneration without enrichment	50
Regeneration with enrichment	28
Multipurpose planting projects	12-21

* No economic justification for continued government spending.
Source: Pradhan and Pillai-Essex (1993).

Based on the above, PPE recommended that broad allocations in agriculture be restructured away from the fertilizer subsidy and crop production schemes towards O&M for irrigation, support for groundwater irrigation, operational expenses for agricultural extension, agricultural research, and forestry projects geared toward regeneration through protection.

6

INTERSECTORAL EXPENDITURE ANALYSIS

Issues in analyzing intrasectoral allocations have been discussed in preceding chapters. Given these, how can relative allocations across sectors be analyzed—e.g., health, education, transport, agriculture and defense? This problem of *intersectoral* allocation of public expenditures has proven to be a complex and intractable one over the years. Numerous reports and studies cite it as a significant problem, but admit to its vexing, complex difficulties. According to the *World Development Report 1988* (on Public Finance), "Intersectoral spending allocations are inevitably based largely on intuitive judgments" (World Bank 1988, p.112).

This paper underscores the analytical and empirical difficulties that others have recognized in this area. The principal problems arise because of the difficulties in valuing and comparing benefits across sectors. At the same time, it concludes that it is possible to not leave the problem solely in the realm of intuitive judgement, but the framework for expenditure choice can be applied to better inform decision making on intersectoral allocations. In actual practice, these are admittedly matters of intense political negotiations where economic analysis has scarcely been used. While some of these political and institutional issues are discussed in Chapter 7, the bulk of the present discussion abstracts from the institutional context.

There has been no systematic attempt in the literature thus far to identify alternative methodologies for making intersectoral allocations, evaluate their relative strengths, or offer practical guidelines for policy decision making. An initial attempt to do so suggests that the literature has primarily sought to evaluate intersectoral allocations based upon cross-country, time series regression analysis of growth. There are some fundamental problems with this. In this context, an alternative approach is proposed.

Review of cross-country studies

Cross-country studies on intersectoral allocations and output/economic growth

Typically, these studies use cross-country, time series data to examine the impact of different components of public spending on output or economic growth. Some studies have focused on the relationship between public expenditure composition and output or productivity. Aschauer (1989) concluded that infrastructure expenditure in the United States had the greatest impact on private sector productivity, which triggered a subsequent debate on the subject (Morrison 1991, Holtz-Eakin 1991). Baffes and Shah (1993) estimate the productivity of public capital in different sectors (infrastructure investment, capital expenditure in human resources, and military capital). They conclude that human resource capital investment (which does not include recurrent expenditure) has relatively the highest output elasticity, followed by a positive but low output elasticity of infrastructure capital, while military capital showed negative elasticity.

On the relationship between expenditure composition and growth, an important strand of the literature has focussed upon the growth impact of cross-sectoral allocations, specifically, government consumption versus investment. Aschauer and Greenwood (1985) and Barro (1990), for instance, distinguish between predominantly government consumption that enters the household utility function but does not contribute to growth, and government investment complements private sector production (see also Devarajan, Swaroop and Zou (1995)

for a review of the literature). Grier and Tullock provide empirical evidence to this effect. Using pooled cross-section/time-series data for 115 countries including 24 OECD countries in the post-World War II period, they find a significantly negative relationship between government consumption's share of GDP and growth.

On intersectoral allocations and growth, the studies that exist point to conflicting implications for the relative growth impact of different sectoral expenditures (see Table 6.1 for a summary). The earliest attempt by Diamond (1989) finds that social sector expenditures and current expenditures for productive sectors exert a positive impact, capital spending has a negative impact, and infrastructure has no discernible impact. Kormendi and Meguire (1985), Grier and Tullock (1987), and Summers and Heston (1988) conclude that public expenditures on education and defense is unproductive. On the other hand, Barro (1990), using an "endogenous growth" model as the theoretical framework, examines the relationship between the composition of public spending and economic growth for cross-sectional, time-series data on 98 countries. He concludes that public education and defense spending contribute to growth, while resources devoted to other government expenditure are associated with lower growth. Easterly and Rebelo (1993) use cross-country, time-series data from 28 developed countries to examine the relationship between investment and GDP growth. They conclude that investment in transport and communication is positively correlated with growth and has a very high coefficient.

Table 6.1: Lack of Consensus on Composition of Public Spending and Output/Productivity Growth
(summary results from a sample of studies)

Study	*Current*	*Capital*	*Health*	*Education*	*Transport and communication*	*Defense*
Baffes and Shah (1993)			+[a]	+[a]	+	-
Grier and Tullock (1987)	-					
Barro (1990)	-			+		+
Diamond (1989)	+[b]					
Easterly and Rebelo (1993)		+[c]			+[c]	-
Devarajan, Swaroop and Zou (1995)	+	(-)	(-)	(-)	(-)	
Deger (1986)						(-)

+: positive and significant
(+): positive and insignificant
- : negative and significant
(-): negative and insignificant

a/ human resource capital investment.
b/ current spending on productive sectors.
c/ investment on transport and communication.

Devarajan, Swaroop and Zou (1995) provide a particularly comprehensive attempt to study the impact of expenditure composition on economic growth to explicitly shed light on intersectoral and cross-sectoral allocation issues. They use data from 29 countries covering the period 1970-90. The dependent variable in their regressions is a five-year, moving average of growth in per capita real GDP. The independent variables included the share of total government expenditure devoted to current, capital, defense, health, education and transport and communication. The IMF's GFS is used as the source for the public expenditure data. In addition, the regression controlled for the share of total government expenditure in GDP, external shocks, and the size of the black market premium as the proxy for policy distortions. The regressions yield surprising results: (i) current expenditure has a positive and statistically significant impact on growth, while capital spending is negative and insignificant; (ii) the share of transport and communication has a negative and significant coefficient, while the share of health and education has a negative but insignificant coefficient; and (iii) within health and education, preventive medicine and "other education" have a positive and significant coefficient.

Devarajan and others offer some plausible explanations for these surprising results. Most significantly, they note that the results may reflect a problem in the link between public spending and outcomes. For instance, inefficiency in the use of public spending may imply that expenditures are not translated into outcomes.

However, there are two deeper problems that all the studies above share in common. First, such cross-country studies present evidence about the "average" impact, and it is infeasible to control for the myriad of factors that typically determine marginal returns of particular intersectoral allocations across countries at different points in time. Second, the level of aggregation in the expenditure variables makes it difficult to discern what the results mean. In particular, as the sectoral discussions before have stressed, there are a variety of programs within sectors or aggregate economic categories that have radically different impact on various outcomes, and have very different rates of return. In this context, to analyze the growth impact of education spending as a whole—when it could consist primarily of primary education in one country and tertiary in another—is not very meaningful. In addition, various programs may affect economic growth through very different time lags than the next five years' moving average. Devarajan and others' is the only study where there is an attempt to conduct the analysis at a more disaggregated level; however, given the data that are available, this could be done only with central government data (the general government regressions are done for 12 countries only at the sectoral level) when the bulk of spending on many programs are financed by state and local governments.

Finally in the area of macro studies on the composition of public spending and growth, it is useful to consider the impact of *defense/military expenditure on growth* in the context of intersectoral expenditure allocations. The particular importance of this subject lies in the fact that it is often contended that military spending is "unproductive," and hence, intersectoral reallocations should be made to lower spending on defense (McNamara 1991). What is the evidence on this? The issue of military spending and growth has spawned a large and diffuse literature following the controversial work of Benoit (1978). Benoit used a sample of 44 developing countries with data from 1950-65, and found that military spending had a positive and significant impact on growth. This was followed by a wave of studies using different specifications. For instance, Lim (1983) and Faini, Annez & Taylor (1984) found a statistically significant negative relationship; Deger (1986) finds that the direct effect of military spending is positive, but that allowing for indirect effects on savings and trade, the effect is negative.

Instead of positing either a positive or a negative relationship between military expenditures and growth, a recent study by Landau (1993) provides an interesting variation in testing for and finding support for a quadratic relationship between the two. In other words, military expenditures contribute to growth up to a certain point after which it leads to reduced growth (see Table 6.2).

Table 6.2: Impact of Military Expenditures on Economic Growth

	Growth over 7-year periods	*Growth over 6-year periods*
MES	0.342	0.479
	(1.74)	(2.17)
MES^2	-0.025	-0.037
	(2.02)	(2.61)

Notes: 1. MES = Military Expenditure/GDP.
2. For expositional simplicity, other independent variables have not been shown.
3. Figures in parenthesis are t-statistics.

Source: Adapted from Landau (1993).

Overall, the literature on public expenditure composition (including military spending) and economic growth does not provide convincing evidence even on the direction of impact. In addition to the limitations mentioned above, these studies share a common problem with the aggregate studies of infrastructure stock as well—their cross-country emphasis combined with the obvious inability to control for all the key variables (e.g., precise state of infrastructure/indicators, traffic flows, disease burden, labor market, external threat) renders it of limited utility in guiding any particular country at a given point in time. Consequently, while such studies

provide useful evidence on average impact, for a variety of reasons they cannot be expected—by themselves—to provide practical guidance for intersectoral allocations.

Cross-country studies on stock of capital and economic growth

Following from one of the limitations of the studies on the composition of public spending and growth, it is useful to examine the relationship between the stock of physical and human infrastructure and economic growth. The review of this literature reveals the positive link between measures of physical and social infrastructure is fairly robust across studies and methodologies (e.g., Jimenez 1995, Kessidas 1995). However, there is less consensus on the magnitude of that contribution.

The WDR 1991, for instance, finds that the accumulation of human capital through education has a positive and significant impact on growth. In particular, it finds that increasing the average amount of education of the labor force by one year raises GDP by 9 percent. This holds for the first three years of education, implying that three years of education compared with none raises GDP by 27 percent. The return to an additional year of schooling then diminishes to about 4 percent a year—or a total of 12 percent for the next three years (WDR 1991, p.43) The literature reviewed by Weale (1992) points to a number of studies that find a positive relationship between the stock of human capital and growth. However, it also points to considerable variation in the magnitude of that impact. Moreover, a study done for the WDR 1993 (Jamison and others, forthcoming) find that the status of health is positive related to growth, and that this relationship holds even when education is present. It is unclear, however, from this study what the *relative* contribution of health versus education is or what it would be at the margin for any given country.

In physical infrastructure, Canning and Fay (1993a) use panel data for the period 1960 to 1980 for 104 countries, and conclude that the physical stock of infrastructure as measured by kilometers of paved roads and railways, and the number of telephones, has significant, positive effects on the growth rates. The rates of return of the increases in physical infrastructure are found to be around 40 percent for the United States and even higher for countries with a lower infrastructure-to-output ratio. In Canning and Fay (1993b), the economic rates of return to these expenditures are calculated using construction costs. This reveals very high rates of return for the fast-growing, East Asian countries and "normal" returns in South Asia and high-income countries. Kessidas (1995) reviews other studies, which find a positive correlation between various indices of physical infrastructure and GDP per capita. Finally, at a sectoral level, Binswanger and others (1987, 1989) control for ago-climatic effects, and conclude that roads have a strong positive impact on aggregate agricultural output, and the growth of electricity power helps explain farm output.

While research has concluded that both human and physical infrastructure can contribute to growth, their relative impact is unclear. A promising area for further research is to combine different sectoral outcomes or indicators and examine their relative impact on growth. However, the problems referred to earlier about the aggregation and cross-country nature of these studies will likely remain. In particular, it will be difficult to get data that can sufficiently capture the state of physical and human infrastructure for a particular country to be able to inform where increased expenditure allocations must be made at the margin. Moreover, as argued below, the emphasis on growth is necessarily limiting given that other objectives (e.g., direct utility impact from health or defense/threat) and their benefits are central to the problem of intersectoral allocations. Nevertheless, these can help inform the costs of meeting the other objectives.

In summary, by themselves, these cross-country analyses are unlikely to provide useful policy implications for a given country.

Proposed approach to analyzing intersectoral allocations

This paper suggests that the same three criteria be applied to intersectoral allocations, as they were to intrasectoral allocations. This would imply assessing intersectoral allocations based upon: (i) role of government versus the private sector; (ii) cost-benefit analysis of input-outcomes packages using sensitivity analysis; and (iii) impact on the poor.

Intersectoral expenditure analysis based on public-private roles

This offers a potentially powerful and simple mechanism for restructuring intersectoral allocations in many developing countries. In particular, there is no compelling rationale for public expenditures in sectors such as *industry* but also increasingly in *telecommunications* and *power* (Chapter 5). Even within other sectors such as health and education, the evaluation of intrasectoral expenditures as discussed earlier will imply a reallocation towards programs providing public goods and strong externalities (e.g., public health, primary education) and away from programs where there is little justification for public provision (e.g., tertiary health care, university education). This could also imply fewer resources for programs where there may be some justification for public intervention, but where public provision could substitute for or only marginally improve upon the private sector (e.g., clinical care, secondary education). Retrenchment or reduced allocations of public expenditures away from such sectors and programs would necessitate concomitant reforms in the incentives and regulatory framework to fully elicit efficient private sector response. *This implies that the first step in intersectoral or interprogram allocation should be to channel resources to those programs that the private sector cannot undertake, and away from programs that constitute the comparative advantage of the private sector.* These considerations led to significant intersectoral reallocations in countries such as Ethiopia, Lithuania and Estonia during the early 1990s.

The overall intersectoral reallocations based on the changing role of the state can be illustrated using the example of Ethiopia. For instance, with the Ethiopian government in the transition from a command to market economy, and from war to peace, there is a marked and discernible shift in intersectoral allocation reflecting the underlying shift in the role of the state. In particular, the share of expenditures devoted to defense, agriculture and industry has fallen sharply, while that devoted to infrastructure, health and education has risen sharply as shown in Table 6.3.

Table 6.3: Ethiopia: Intersectoral Reallocations and Role of Government
(percent of total expenditure)

	FY93	*FY94*
Agriculture/industry	18	8
Defense	25	8
Infrastructure	4	13
Social services	12	24

Source: Calculated from World Bank (1994a).

Past an identification of intersectoral imbalances based upon public-private roles, however, there will still remain the problem of allocating resources among heterogeneous programs that constitute legitimate areas for government intervention with potentially high returns. These could include, for instance, the choice between alternative combinations of interprogram allocations among road maintenance, public health, primary education, agricultural research and extension, and defense. This brings up the second criterion for interprogram expenditure choice—i.e., cost-benefit analysis across these alternative combinations.

Cost-benefit of intersectoral and interprogram allocations

The problems of benefit valuation

To analyze the net benefit across intersectoral programs, the policymaker would need to identify an average project profile given the scale of the increase or decrease in interprogram allocation being envisaged. The rate of return to this average project could then be adjusted for scale effects, and compared with other rates of return. The principal difficulty, of course, is that project rates of return may not be available because of difficulties in benefit valuation. To see this, consider the attached Table 6.4, which lists the shadow price for a typical project in all the key programs based upon the companion paper (Pradhan 1994). This shows that the problems lie not so much with estimating the shadow price for agricultural/industrial sector, for instance, given that these depend on crop/product prices. Moreover, even in the case of physical infrastructure, the term for the change in profits in the equation can be calculated as the change in vehicle operating costs as suggested in the previous chapter, although externalities have not been estimated in the literature. The problem occurs more with health, education and defense, where both the direct benefits and benefits from externalities/public goods are very difficult to measure.

In *health*, as discussed in more depth in Chapter 3, the cost-effectiveness criterion that is typically used and advocated in health sector analysis will not be useful or appropriate. Cost-effectiveness requires a target to be met, and that target, if unquestioned, takes prior claim over other expenditures. Consequently, it begs the question of intersectoral allocations. For instance, as the health sector discussion points out, to meet the essential health package in the WDR 1993 would imply significantly more resources devoted to health in low-income countries, even after all intrasectoral reallocations are made from tertiary services. This therefore necessitates a judgment of whether it is justified to spend more money on health, as compared say to education. As argued in the health section, there is no escaping the necessity to estimate the value of reduction in risk of dying or injury. As shown in Table 6.4, in addition to the human capital effect, there are significant direct utility impacts in health (the second term in the equation), and this will necessitate some measurement of individuals' willingness to pay for life and better health. To this end, one option is to carry out better labor market studies such as compensating wage differentials in developing countries. In view of the estimation biases in such studies, some measure of willingness to pay through contingent valuation surveys need to be attempted. If health outcomes are known, then the values emerging from such studies can be used for carrying out sensitivity analyses.

For *education*, as discussed in more depth in Chapter 4, the human capital approach has been typically used (first term). However, these have some important limitations given their inability to measure the private market counterfactual and to typically disentangle the impact of schooling from other factors such as family background to estimate the human capital impact. Moreover, as the discussion in the education section underscores, these can overlook not only the direct utility impact of education (second term), but also the significant and complex externalities (third term). It is inescapable to try to estimate for these either through macro studies that endogenize education externalities, or through better micro studies on valuing the link between education and other outcomes and the valuation of such outcomes. Once again, the need to assess society's willingness to pay for education becomes imperative.

Table 6.4: Shadow Price of Different Sectoral Projects

Agriculture/Industry (border price of tradable)

$$\pi_z r$$

Physical infrastructure (change in private profits)

$$\frac{dW}{dx} = \pi_L\left(p\frac{\partial y}{\partial x}\right) + \pi_z\left(p\frac{\partial x_i}{\partial x} + \frac{\partial R}{\partial xj}\frac{\partial x_j}{\partial x} + \frac{\partial R}{\partial y}\frac{\partial y}{\partial x}\right)$$

$$= \pi_L\left(p\frac{\partial y}{\partial x}\right) + \pi_z\left(r\frac{\partial x_j}{\partial x} + \frac{\partial R}{\partial y}\frac{\partial y}{\partial x}\right)$$

Social services (human capital, direct utility + externality effects)

$$dW = \sum_{h=1}^{H}\frac{\partial W}{\partial U^h}\left\{\pi_L\left[\frac{\partial W^h}{\partial S^h}\frac{\partial S^h}{\partial x}(t-Le)\right] + \frac{\partial U^h}{\partial S^h}\frac{\partial S^h}{\partial x} + \sum_{k\neq h}^{H}\frac{\partial U^h}{\partial S^k}\frac{\partial S^k}{\partial x} - \pi_L^h x\frac{\partial p}{\partial x} + \pi_z^h\left(p + \frac{\partial R}{\partial x} + x\frac{\partial p}{\partial x}\right)\right\}dx$$

Defense (impact of threat on income and direct utility)

$$dW = \sum_{h=1}^{H}\frac{\partial W}{\partial U^h}\left\{\pi_L p\frac{\partial y}{\partial t}\frac{\partial t}{\partial x} + \frac{\partial U^{Lh}}{\partial t}\frac{\partial t}{\partial x} - \pi_L x\frac{\partial p}{\partial x} + \pi_L\left(p + \frac{\partial R}{\partial x} + x\frac{\partial p}{\partial x}\right)\right\}dx$$

Source: Derivations in Pradhan (1994).

For *defense* spending, threat can have an impact on income/growth (first term) but also on welfare (second term). The attempt to assess the relationship between military spending and growth based on macro studies has proved elusive, as discussed earlier. Indeed, just as with health and education, there is no escaping assessing in some depth the benefits and costs of military spending. And this complex task cannot be reduced to simplistic ratios of GDP to determine whether military expenditure is excessive. As against this, Mr. Robert McNamara, for instance, has been referring to military spending to GDP ratios of over 2 percent as excessive and calling for bilateral and multilateral donors to link aid to military spending (McNamara 1991). However, econometric studies on the determinants of military spending (see Table 6.5) shows one very strong and powerful result: quite simply, neighbors' military spending—a proxy for threat in the shadow price derivations in Table 6.4—is the dominant and most important determinant of military spending. If this is so, then whether or not military spending is adequate or wasteful will depend upon the nature of threat faced, the composition of spending, its impact on security and deterrence, etc.

Table 6.5: Determinants of Military Spending

	3-year average		5-year average	
	spec.1	spec.2	spec.1	spec.2
Neighbors' military spending	0.534	0.547	0.545	0.552
	(12.4)	(12.5)	(11.1)	(11.1)

Note: For expositional simplicity other variables have not been shown.
Source: Adapted from Landau (World Bank 1993).

Indeed, to assess whether military spending is "excessive" would require a sector analysis of benefits and costs just as in other sectors laid out in preceding chapters. This has not been done in this paper because an assessment of military spending runs counter to the Bank's articles of agreement and because the Bank possesses no expertise, experience or best-practice knowledge in the area. This would necessitate a cost-benefit analysis as in other sectors to assess the level and composition of military spending. For the *benefits*, some kind of a *threat analysis* would become essential to assess whether military spending is excessive, or to decide upon its composition. Elements of a threat analysis would include neighbor's military spending, size of neighbor's force/troops, configuration of troops and types of weapons procured, realistic appraisal of external and internal sources of instability/ conflict, etc.

Even after threat assessment has been made, there is the issue of how to place a value on reduction of threat and enhancement of security. Even if better evidence and consensus was reached about the income/growth impact of threat (first term in Table 6.4), these studies would not capture the direct utility impact of security, which would once again require assessment of society's willingness to pay for the public good. Consequently, the principal challenge in intersectoral and interprogram allocations is to value outcomes whose market prices do not exist or if they exist, are inaccurate.

Three-step analysis to approximate cost-benefit measurement

In light of the above complexities in benefit valuation, this paper suggests that a three-step analysis be carried out. First, the analysis would need to identify alternative combinations of program allocations and their corresponding outcomes (e.g., infant and maternal mortality, quality and quantity of education, road segments constructed and maintained in particular condition, increase in crop yields, reduction in external threat). This requires *transparent information about inputs/expenditures and outcomes* (Table 6.6). Clearly, it is difficult to establish these relationships, but it becomes inescapable to attempt to do so to the extent feasible. It is important for the analysis to take into account interdependencies and externalities between different program expenditures to meet particular outcomes. For instance, there are huge interactions between health and education programs, where, for instance, children's health affects their learning, and mothers' education affects children's nutrition. Consequently, multisectoral or multiprogram expenditures (e.g., girls' education, child nutrition, child health) that best meet particular outcomes (e.g., integrated child development) would need to be taken into account in establishing interprogram expenditures-outcome relationships.

Table 6.6: Marginal Rates of Return and Inputs/Outcomes for Intersectoral Allocations
(hypothetical for change in $1)

	ERR	*DALY saved*	*Number educated or improvement in test scores*	*Reduction in probability of external aggression*
Agriculture extension/research	12%			
Industry	0			
Transport	20%			
Health		0.001		
Education			0.005	
Defense				0.002

Source: Pradhan (1994).

Second, an attempt needs to be made to evaluate the tradeoffs between alternative combinations of program expenditures-outcome combinations, and select the program expenditure-outcome combinations that are most socially desirable. The central problem here, of course, is that it is difficult to measure and compare the benefits across programs in key sectors. Nevertheless, sensitivity analyses can be carried out using plausible ranges for values of outcomes from studies elsewhere (e.g., estimates of the value of life from developed countries of between $3 to 7 million), and transparent packages of input-outcome choices resulting from alternative interprogram allocations can be presented to policymakers. Table 6.6 shows a hypothetical example of rates of return and input-outcome relationships across sectors. This can be used to judge *trade-offs* across sectoral expenditures, and it can be used to conduct sensitivity analysis. For instance, it can be seen how much a DALY saved needs to be worth in order for it to be better than a transport project that gives $1.20 for every $1. In the example shown below, if the social value of a DALY is greater than $200, then that will be preferable to the transport allocations.

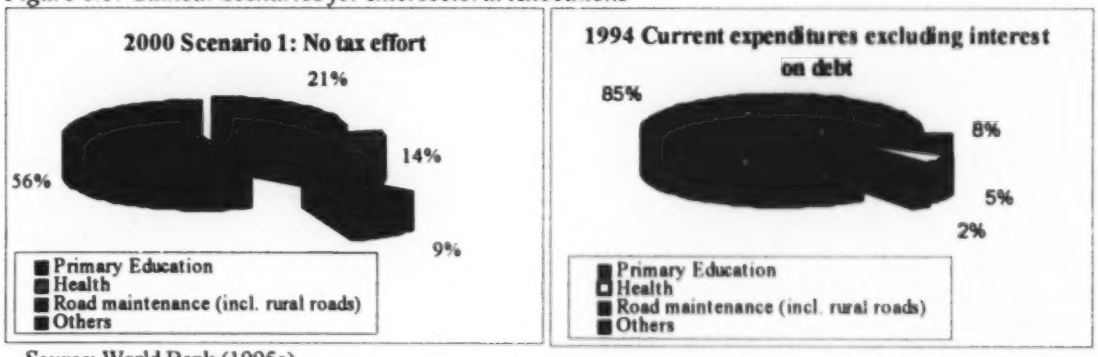
Third, where politically feasible, these input-outcome combinations can be subject to voting through the budgeting process, whereby ministers, legislators, interest groups and households will implicitly place social values on alternative bundles of public goods through the voting process and thereby simulate a political, contingent valuation survey. For instance, if transparent information on expenditure-outcome combinations are available as shown in Table 6.5, then it could be disseminated to the population (or politician in Parliament as a proxy). Indeed, if the budgetary process and information system can make these choices transparent, then in principle households can lobby for particular packages that they are willing to pay for. Given the difficulty in estimating willingness to pay for various expenditure items, this will enable a macro estimation of the willingness to pay through a *politically conducted contingent valuation exercise*. This would imply that the one voice one vote becomes a counterpart to the individual willingness to pay, which underlies the welfarist approach. After all, this is done to some extent in developed countries such as the United States where individuals vote for Democrats versus Republicans based in part on the distinctly different mix of defense and social expenditures that each advocates. The problem is that each party stands for many other issues as well (e.g., abortion), and there are not enough parties for individuals to vote on alternative packages. However, other multi-party (as opposed to two party in the United States) can provide more options for alternative bundles of public spending allocation. Moreover, if there is transparency in inputs and outcomes, and if there is a public debate on these before the budget is finalized (e.g., the health care debate in the United States), it is possible that individual willingness to pay may get reflected in the stands of the parties involved. In general, however, there are obvious limits to this approach because there are not likely to be as many states of the world (parties or public spending allocations) for voters to choose from. However, it will go a long way in having household willingness to pay reflected in budgetary decision making. All of this underscores the necessity of making a more concerted attempt at budgetary transparency on inputs and outcomes. If not anything else, voters can hold politicians accountable to meeting particular outcomes, even if that outcome is not optimal from each individual's point of view.

Typically, governments have objectives or targeted outcomes for the key programs (e.g., public health, primary education) identified above, which can be used as a starting point to derive interprogram allocations. If the resulting interprogram allocations are inconsistent with the resource envelope, then there would need to be an iteration for government to reassess the targets for program outcomes.

Some elements of an intersectoral expenditure analysis exercise as above were carried out in Uganda by the Government and The World Bank in 1991, for instance. The exercise identified and reduced resource allocations for industry, state farms, university education and hospitals. From these savings as well as additional resources accruing from the counterpart funds of donor's balance of payments support, a "surplus" pool for interprogram reallocations was identified. A policy paper was prepared that identified the various high-priority programs to which these resources could be allocated, together with a depiction of the state of affairs of specific program outcomes (e.g., low enrollment, high mortality and morbidity rates from preventable diseases, poor condition of newly constructed roads, declining crop yields) as compared to stated government targets for these programs (e.g., universal primary education within a decade, public health for all). This also included an assessment of defense expenditures, where spending had been growing rapidly while external and internal threat had in fact diminished. The policy paper was discussed internally within government in order to consider alternative scenarios/iterations and achieve consensus on expenditure priorities during the budget preparation process. The net result of the exercise was that the shares of total expenditures for primary education, public health, road maintenance, and agricultural extension were significantly increased, while the share of agriculture, industry, tertiary social services and defense were reduced (see Table 6.7).

More recently, an ongoing exercise in Guinea attempts to estimate the costs of the government's stated targets for primary education, public health and road maintenance to show that this will imply considerable reallocation of resources towards these programs over a three-year period (Figure 6.1).

Figure 6.1: Guinea: Scenarios for Intersectoral Allocations



Source: World Bank (1995a).

Intersectoral programs, targeting and the poor

While interprogram reallocations as above integrally affect poverty, it is important to explicitly evaluate the impact of interprogram allocations on the poor to identify those that meet the poverty alleviation objectives most cost-effectively. Which expenditures across sectors and programs benefit the poor the most? In this context, it is useful to distinguish between universal program or "broad targeting" and "narrow targeting." The former refer to expenditures or subsidies on universal programs that are accessible across income groups, without a concerted attempt to exclude the nonpoor. The latter refer to programs that seek to target benefits to the poor by excluding the nonpoor. A recent book (van de Walle and Nead 1995) comprehensively reviews the analytical framework as well as the empirical findings on the distributional impact of public spending, including both broad and narrow targeting.

Table 6.7: Uganda Intersectoral Reallocations: Defense vs. Social Sectors Expenditure by Functional Classification
(percentage shares)

	1989-90 Actual	*1990-91 Actual*	*1991-92 Actual*
Economic services	8.2	8.7	11.0
Agriculture	2.5	2.7	3.4
Infrastructure	3.4	3.0	4.8
Other	2.4	3.0	2.8
Social services	22.9	26.0	34.2
Education	13.9	16.2	17.2
Health	4.6	5.4	7.9
Local government	1.9	3.0	7.6
Other	2.5	1.4	1.5
Defense	44.6	46.0	26.6
Public administration	24.3	19.2	28.3
Total	100	100	100

Source: World Bank (1992c).

Universal programs or "broad targeting"

To reach the poor, it is important to target expenditure programs that matter the most to the poor. As discussed in Chapters 4 and 5, benefit incidence analyses show that spending on primary education and public health are propoor, and generally reach the poor. This enhances the human capital of the poor, and reduces their current and future poverty. However, as discussed in Chapter 6, there is less empirical evidence available about the relative direct or indirect impact of physical infrastructure on the poor, although ongoing research should help inform this issue. Theory and cross-country evidence shows that across-the-board subsidies for food, housing, universities and hospitals are inappropriate not only on efficiency criteria as mentioned above, but also on account of their poor cost-effectiveness for poverty alleviation, given their leakages to the rich.

In the transition economies of Eastern Europe, social cash transfers, including pensions and family allowances, are a significant source of income for households. Milanovic (1995) finds that at the start of the transition, most transfers are more or less uniformly distributed across income groups. This is because pensions are generally prorich while family allowances are generally propoor.

Overall, the various benefit incidence studies suggest that developing country governments can improve the impact of public spending on the poor by investing and reallocating expenditures towards basic social services and away from tertiary services. More broadly, an effective route to improving the living standards of the poor entails a development strategy, including an appropriate composition of public spending, in which both participation in economic growth and access to basic social services is broad (i.e., including the poor and nonpoor).

"Narrowly" targeted programs for the poor

Even if the composition of expenditures supports broad-based economic growth and access to basic social services, which will benefit the poor in the medium to long run, certain circumstances may necessitate more finely, targeted transfers and safety nets in the short run. For example, victims of drought, undernourished children, and the disabled and elderly cannot wait for long-term solutions. Consequently, policies that attempt to identify the poor and target benefits to them can serve important redistributive and safety net roles in a market economy (World Bank 1990a). The risk is when targeted programs are seen as the main instrument for poverty reduction. While a well-designed targeted scheme can constitute an important complement to a longer term poverty

reduction strategy founded on equitable growth and propoor broad targeting of public spending, it is an imperfect substitute.

The choice of targeted schemes must be based upon their benefits and their costs. In theory, targeting can lessen the social cost of reducing poverty. Indeed, given the leakages to the rich from universal programs, a usual policy prescription that is offered is to deliberately "target" public expenditures to the poor, so as to exclude the nonpoor. However, it is critical to note that programs that attempt to exclusively target the poor may or may not have a greater impact on poverty alleviation than alternative uses of the same budget. That will depend upon the design and costs of targeting.

The cost of targeting is not merely the transfers that are made to the beneficiaries. To begin with, the costs of administering a program can rise substantially the more finely the program attempts to target. For instance, administrative costs of means tested programs in the United States are have been estimated at 12 percent of total costs as opposed to 2.5 percent for universal programs. Targeting also involves other costs typically not taken into account—e.g., participation or opportunity costs of the poor, and other behavioral responses, such as reduction in private transfers. These costs can be significant, and thereby influence the assessment of the targeted schemes.

In order to estimate the total costs of targeted programs, recent research has utilized estimation-based behavioral approaches to model and incorporate behavioral responses. For instance, in order to assess the real impact of a public employment scheme on poverty in Maharashtra (India), Ravallion and Datt net out the foregone income of participants from the transfer benefits (Ravallion and Datt 1995). They find that the forgone incomes account for about one-quarter of total wage earnings on the scheme. As a result of these costs, and the additional non-wage costs, the scheme entails a net transfer of only about half of its budget to the poor. Similarly, Sahn and Alderman estimate the net transfers to households taking into account the labor supply disincentive effects of the targeted food stamp scheme in Sri Lanka (Sahn and Alderman 1995). They estimate that the scheme has resulted in a fall in labor market participation of as much as 2.5 days per month for males and 2.9 days for females, which translates into 33 percent of the value of the subsidy benefits. Cox and Jimenez estimate private transfers to beneficiaries are reduced significantly on account of public transfers in the Philippines (Cox and Jimenez 1995). While targeted programs may still be desirable, it is important to take into account these costs.

Consequently, targeted programs need to take into account their net impact on the poor relative to alternative uses of the available resources. The impact on the poor depends upon the benefits from the scheme less any costs they incur in participating. The resources include the budgetary cost as well as certain costs incurred by the nonpoor. Ravallion and Datt (1995) constitute among the few attempts to estimate the net impact on poverty relative to alternative uses of the same budget. Their results are sobering. Once all the costs associated with the public works scheme have been weighed, the same outlay uniformly transferred to all households appear to make no less of a dent on income poverty.

A key lesson of experience and many studies is that the costs and benefits of targeting depend critically upon program design. Subsidizing a food staple heavily consumed by the rich, or setting the wage rate too high, can increase leakages to the nonpoor. In practice, the most extreme form of targeting, means targeting, is difficult and costly to do well in developing countries. Incomes are particularly hard to measure in poor agricultural settings where they are also subject to extreme variability from one season to the next. Effective means testing would require collection of detailed and comprehensive information coupled with continual updating and verification. Reliance on local agents with intimate knowledge has sometimes been found to work well, and sometimes to flounder in nepotism and corruption. In this context, it is useful to look for identifying characteristics, or indicators, which are highly correlated with low incomes (e.g., geographical location, landlessness, nutritional status, employment status). The challenge is to identify correlates that are easy to observe but difficult to manipulate (e.g., gender and old age); however, these are not always easy to identify. In

poor countries, self-targeting often works better than means-testing. Self-targeting schemes are designed such that the poor, and only the poor wish to participate. They achieve this by imposing a cost of participation only the poor are willing to incur (e.g., a work requirement in return for low wages). This allows the poor to identify themselves, thereby minimizing targeting costs while resulting in well-targeted benefit incidence. Self-targeted programs, such as programs targeting inferior goods (e.g., lower quality food products in Tunisia and cassava in Indonesia), have indeed succeeded in cost-effectively reaching the poor. Although administrative costs of identifying the poor are minimized, the participation costs should not be underestimated.

In summary, while targeting often better concentrates benefits on the poor than universal programs, it will not necessarily have a greater impact on the poor once the extra costs have been factored in. Consequently, targeting should be seen as a potential instrument, not an objective. In general in many developing countries where poverty is widespread and administrative capacity low, some combination of broad targeting, or universal provision, of key, basic services (e.g., public health and primary education) together with some narrow targeting of particular programs exclusively to the poor will be required to reach the poor through public expenditure policies.

7

ANALYZING INSTITUTIONAL ARRANGEMENTS IN THE PUBLIC EXPENDITURE MANAGEMENT SYSTEM[2]

Thus far, the focus has been entirely on the analysis of the level and composition of public expenditure allocations. The institutional context has not been incorporated in the analysis. However, to improve public expenditure allocations, it is important to evaluate both the institutional arrangements—or rules of the game among key decisionmakers who allocate public spending—that influence and determine these expenditure allocations, as well as the allocations themselves. Indeed, a principal implication of the discussion in the preceding chapters is that numerous analytical and empirical complexities constrain the analysis of broad allocations of public spending. In this context, it becomes even more important to evaluate underlying institutional processes and incentives, and support institutional reform that can result in improved expenditure allocations on a sustained basis.

Unfortunately, World Bank PERs, have traditionally placed grossly insufficient emphasis on institutional issues. However, recent PERs (e.g., Namibia, Guinea, Nigeria) are redressing these shortcomings, and placing emphasis on identifying weaknesses in government budgeting systems and institutional arrangements that impede the achievement of better expenditure outcomes. In these newer breed of PERs, a key emphasis is on enhancing government involvement and ownership, with the goal of having the PERs be undertaken by the government itself, as an integral part of its public expenditure planning and budgeting system. A notable example comes from Ghana, where after a series of Bank PERs the two most recent PERs have been produced by the Government itself.

If PERs must increasingly focus on strengthening government budgeting systems, there is a need for a framework that can help identify and analyze the institutional arrangements that contribute to improved expenditure outcomes. Unfortunately, there is a paucity of research in this area that can provide a suitable framework as well as supporting evidence. The literature that does exist often describes formal rules in the budget process (UN 1992, Premchand 1993). However, this literature does not attempt to identify key elements in the public expenditure management system that might affect expenditure outcomes in systematic ways. Some recent research is focusing on the subject, but they are still in too nascent a stage to provide convincing evidence. A Public Expenditure Management Handbook is also being jointly produced by the Bank and the Fund to provide lessons from operational experience on a range of management issues.

In this context, this chapter presents an initial framework and an associated set of key diagnostic questions that can be used to analyze institutional arrangements in the budgeting system, illustrated by some country examples.[2]

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2. Discussion of this framework is based upon research paper currently in preparation by Pradhan and Campos (forthcoming).

Framework for diagnosing institutional arrangements

The analytical framework seeks to identify formal and informal rules in a country's public expenditure management system that influence or contribute to a vector of three key expenditure outcomes: (i) aggregate fiscal discipline, or control of aggregate budget deficits and expenditures; (ii) the prioritization or composition of this aggregate expenditure among sectors, programs and projects to maximize social welfare; and (iii) technical efficiency in the use of budgeted resources. It is important to note that the discussion in the preceding chapters has been focused on analyzing actual allocations corresponding to the first two outcomes above—i.e., the level and composition of public expenditures—without attempting to identify institutional arrangements that might influence or determine these outcomes. The third outcome—technical efficiency—has obviously not been of direct concern thus far, because it focuses on the technical efficiency with which a given level and composition of expenditures are used.

Public expenditure management is characterized by four distinct but related theoretical problems. The *first* has to do with what is known as the tragedy of the commons. Disparate claimants on government spending view the budget as a common resource pool that they can dip into with little or no cost. The *second* is a problem of information asymmetries and high transactions costs that may impede an efficient mapping of expenditures by government with the preferences of individual and groups in civil society that constitute its power base. The *third* arises from information asymmetry and incentive incompatibility within the government hierarchy (e.g., the relationship between the central and line ministries) that can impede a socially desirable allocation and use of budgeted resources. The *fourth* arises from perverse incentives that may stem from external, donor assistance in aid-dependent developing economies. Each of these problems can result in socially undesirable outcomes. Institutional arrangements can help redress these problems to some extent, and thereby improve expenditure allocations.

Tragedy of the commons

Nature of the problem

There are many claimants to the budget—line ministries, interest groups, and donors. Each has different preferences over how the budget is to be allocated, i.e., the composition of spending, and each exerts pressure on the government to bias spending in the direction of their preferences. Given taxes are collected from the general public, the tax burden of a claimant's spending priorities, which is spread across many groups and individuals, is likely to be considerably lower than the total social cost of the implied programs. On the other hand, the benefits accrue mostly to the claimant. Consequently, a claimant will always demand a level of spending on its desired programs that exceeds the level that is socially optimal. Since claimants do not incorporate the full burden of this tax on their own decision calculus, their spending demands are likely to result in a deficit that exceeds the optimally desirable level. For this reason, institutional mechanisms to control the aggregate level of spending become important. Absent any constraint, meeting the demands of disparate claimants is likely to result in large, unsustainable deficits that translate into macroeconomic instability which can eventually undermine the government.

Implications for institutional set up

The tragedy of the commons problem can be mitigated by basing the budget on a consistent and binding medium-term macroeconomic framework, granting the central ministries a dominant position on decisions concerning aggregate spending, and by establishing formal constraints on spending and borrowing. A macroeconomic framework provides a basis for evaluating the implications of the aggregate spending and budgetary deficit for macroeconomic variables, such as inflation, interest rates and exchange rates. Hence, it gives the government a means to have claimants incorporate the cost of fiscally-induced macroeconomic instability into their decision calculus. A medium-term focus also helps show the future benefits from current sacrifices or cuts. Having the

central ministries control aggregate spending is necessary. Line ministries and legislative committees have relatively parochial views on public expenditures. By virtue of their mandates and jurisdictions, the central ministries are better able to evaluate the big picture of which aggregate spending and macroeconomic trends are major components. But, given the nature of politics, making these ministries formally responsible for aggregate fiscal discipline may not be enough. Establishing laws that put specific limits on spending and borrowing (to finance a deficit), e.g., the deficit cannot be more than x percent GDP, help provide some formal constraints on fiscal aggregates. The central ministries can use these laws strategically to impose cuts on excessive demands from claimants, i.e., the laws improve the central ministries' bargaining position.

While such rules may exist on paper, a key issue is whether they are binding. This requires institutional arrangements that make fiscal indiscipline transparent and that hold the government accountable, making it costly to misbehave. Institutional mechanisms that can facilitate this include mandates for a reconciliation between *ex ante* and *ex post* outcomes (e.g., budgeted versus actual spending and deficits), sanctions for nonachievement of targets, and publishing these as well as making them public. In addition, openness of financial markets can transmit the costs of fiscal indiscipline to constituencies while making it costly to distribute rents, thereby serving as a disciplining mechanism on governments.

Information asymmetries and transactions costs in expenditure-preference mapping between the government and civil society

Nature of the problem

Given a "hard budget constraint," governments must make tradeoffs and set strategic priorities about how a given level of resources is to be allocated across sectors and programs. In this context, one set of problems stems from information asymmetries and high transactions costs that impede efficient mapping of expenditures in accordance with the preferences of individual and groups in civil society. In principle, individuals and interest groups in civil society (i.e., the principal) would want the government (i.e., the agent) to provide the mix of public goods and services that maximize their welfare. In practice, however, the principals have incomplete information about expenditure allocations, or how these would impact them. And they face high transactions costs in acquiring better information.

Implications for institutional set up

Institutional arrangements that can help reduce these transactions costs to facilitate better expenditure-preference mapping include (i) mechanisms to reveal demand of civil society about the preferred mix of outcomes or budgetary priorities; (ii) transparency about the process of making budgetary allocations (including proposed allocations and their outcomes) as well as about the actual allocations and their outcomes; and (iii) mechanisms to penalize or reward the government for the expenditure allocations that are made.

The first would imply institutional arrangements that ensure that the breadth of consultations or oversight incorporates the feedback from civil society at relatively low transactions costs. The most extensive, tractable form of consultations is likely to involve parliamentary discussions of the budget. Parliamentarians represent some segment of the population as well as certain interest groups. Moreover, parliamentary committees and subcommittees generally evaluate specific components of the overall public expenditure program. So by exposing public expenditure allocations to parliamentary scrutiny, the government can get feedback on the appropriateness of the priorities it has set and can make adjustments accordingly. It is important to note however that effective use of this mechanism requires that Parliament have enough technical support (staff and equipment) in order to be able to credibly challenge the government analysis that underpins the proposed public expenditure program.

The second implication above—transparency—requires that information about the budget be published and made public. However, this should not just be voluminous budget documents with expenditure allocations, as they are often quite opaque and may not tell civil society much about what expenditures are trying to achieve. This should contain information on expenditure outcomes, including through *ex post* reconciliation and evaluation. This would imply a budget process that is geared towards the achievement of results, as well as features that make these transparent both *ex ante* and *ex post*.

The third institutional implication would be for some mechanism for civil society to reward or penalize expenditure allocations that are made. Typically, this would be through the voting process, in which the non-performing government is voted out. However, since a government is voted in on the basis of many criteria, this would appear to be too blunt a mechanism for accountability.

The decentralization of some expenditure decisionmaking to local levels of government could constitute another institutional arrangement that could potentially improve information and lower transactions costs in the expenditure-preference mapping. In particular, local governments can generally be expected to possess better information about local preferences. In general, greater autonomy for local governments to allocate resources for local public goods and services can result in potentially improved expenditure allocations. However, whether local governments in fact act in this manner will depend upon whether they are held accountable for results, which in turn will be a function of how transparent the budget allocations and corresponding outcomes are, and how accountable the local politicians are. Further, the design of intergovernmental transfer will influence the incentives for efficiency and equity on the part of local governments.

Information asymmetry and incentive incompatibility within the government hierarchy

Nature of the problem

Given the broad preferences that emerge from the relationship between the political leadership in government and its power base in civil society, there are information asymmetries within the government hierarchy that may impede translating these preferences into strategic priorities for expenditure allocations, and ultimately into socially desirable outputs and outcomes. In particular, line ministries, departments and agencies—because of their closeness to the clients and day-to-day operations in a specific sector or subsector—can be expected to have superior information about how intraministerial and intradepartmental expenditure allocations can contribute to outputs and outcomes, but their incentives are to bargain for as much resources as possible. Further, they implement budgeted programs, but unchecked, their incentives would be to divert resources for parochial or personal gain. The political leadership in the government (e.g., the Cabinet), or for that matter, the central ministries do not possess the necessary information to make disaggregated budgetary allocations. And lacking this they are unlikely to allocate resources in accordance with strategic priorities. Because of high transactions costs, they will find it difficult to siphon this superior information solely via a top down approach, and will have to rely upon line ministries and agencies to make disaggregated spending allocations. Hence, they must introduce a scheme that induces line ministries to reveal this information (and thus reduce the transactions costs), and ensure that programs are implemented in a technically efficient manner.

Implications for institutional set up

In this context, the central ministries have to balance the macro constraints with allowing more flexibility by line ministries to allocate resources to capitalize on their superior information and for departments and agencies to implement programs and projects. A medium-term expenditure framework (MTEF) can constitute an institutional mechanism to achieve this balance between the macro and micro tensions in resource allocation. An MTEF could provide line ministries with resource allocations within the aggregate resource envelope based upon medium-term strategic priorities, and then have them articulate the sectoral objectives, programs and unit costs to achieve sectoral outcomes within their resource envelope. At the same time, for this to yield desired results,

line ministries need to have incentives to allocate resources cost-effectively, and departments and agencies will need to have incentives to use resources in a technically efficient manner. Line ministries, departments and agencies therefore need to be held accountable for the allocation and use of budgeted resources. Mechanisms for accountability would include financial accountability and audits, value for money audits, *ex post* evaluations, performance-based contracts of chief executives, etc.

An important distinction needs to be made between *financing* and *delivery* of goods and services. Even where the central or line ministry decide to allocate resources or finance particular programs through some kind of strategic priority setting process as above, they need to ensure technically efficient delivery of goods and services. And this requires ensuring that the incentives in the institutional framework are most conducive for efficient and effective service delivery. Technically efficient service delivery will imply simulating the incentives of the private market, whereby customers have the flexibility to choose among contestable service delivery options by the public or private entities. However, this will depend upon the nature of market failure within the particular sector, subsector or program. In general, the "marketability" of publicly-financed goods and services will depend upon: production technology that leads to natural monopoly; the public nature of consumption; constraints on cost recovery; distributional concerns; and the importance of spillover effects (WDR 1994). These can provide a range of institutional options for the financing and provision of goods and services, including public ownership and public operation, public ownership and private operation, private ownership and private operation, and community and user provision. In general, unbundling publicly-financed goods and services can reveal that several components are conducive to private delivery, although they will necessitate an appropriate incentive and regulatory framework. However, as discussed in the preceding chapters, the appropriate institutional form and scope for private delivery will vary depending upon the nature of market failures characterizing specific programs within a sector and the country-specific circumstances.

Even if the delivery of several goods and services are privatized or commercialized, it is quite likely that a core set of goods and services will remain within the public sector that will need to be provided directly by government agencies or departments. This necessitates that the incentives confronting line agency bureaucrats are such as to deliver the outputs of the programs and projects in the least cost way. There are many factors that affect the individual incentives of bureaucrats but perhaps the most crucial is financial compensation. A useful benchmark for the appropriate level is the compensation that a private sector equivalent position commands. The larger the compensation differential between equivalent public sector and private sector jobs, the less incentive a bureaucrat will have to fulfill his duties as a civil servant and the greater his incentive to moonlight or to use his position to extract bribes. Appropriate compensation however needs to be linked to performance. Merit-based recruitment and promotion schemes have to supplement pay schemes. In fact, where these schemes create highly competitive entry and promotion, a certain degree of prestige becomes attached to employment as a civil servant. And this can compensate for some pay differential with the private sector.

While compensation and performance-based schemes are crucial, they are not sufficient to achieve technical efficiency. Because line agencies are better informed about the demands of their clientele and the problems that confront implementation at the field level, it is best to grant them some autonomy over allocation decisions that pertain to their respective budgets, e.g., granting an agency a block amount for running costs. Better allocation translates into more bang for the buck. But this creates potential problems if there are no mechanisms to hold the agency and its employees accountable for delivering the outputs of their programs and projects at a cost imputed in its budget. An ideal solution to this problem is spin off the provider as an independent entity headed by a chief executive officer (CEO). The CEO is given a limited term contract, e.g., five years, with renewal subject to the operating entity's success in delivering key outputs at the agreed "prices." He is also granted the freedom to hire and fire employees under him.

Putting the chief executive officer on a finite term contract and giving him the flexibility to hire and fire on the basis of the needs of the agency (and, in the case of the latter, the performance of employees) introduces an element of accountability. But the CEO will still need to have a relatively low-cost means to monitor the

performance of his employees. One way to do this is to introduce and institutionalize client (user) surveys and have the results published and made public. Not only do these surveys provide feedback on performance relatively cheaply, they also help solve collective action problems among users. Because of high transactions costs and the public good nature of potential benefits, an individual user rarely has an incentive to complain about an agency's service, but (s)he is likely to find it worthwhile to answer a survey questionnaire.

While client surveys can measure client satisfaction for particular types of service delivery, mechanisms are still needed for inducing financial accountability. In particular, it is useful to institute an independent auditing body (perhaps attached to the Prime Minister's Office or the Legislature) with the responsibility for undertaking randomly selected financial and performance audits akin to risk management methods adopted by firms to control product quality and publishing the results of the audits in a publicly-available document. The randomness is crucial since it helps keep monitoring costs down. Making the results public imposes a non-trivial cost to an agency if one or more of its projects is found to be underperforming. It thus gives the auditing process some bite.

Incentives from donor assistance

Nature of the problem

In aid dependent countries, donor assistance finances a significant share of public expenditures. Donor assistance, however, is accompanied by a set of incentives that can both improve or worsen expenditure outcomes. Typically, there a number of donors providing assistance to countries, and each have their own interests and incentives. Broadly, these can be grouped under sectoral donors (including bilateral donors as well as sector divisions within multilateral institutions such as The World Bank) providing assistance for sectoral projects, and central donors (including the IMF, the country operations divisions within The World Bank, and some bilateral donors) who support overall macroeconomic stability and structural adjustment. The former group is interested in financing its own projects, because it gets its internal rewards from project financing. The latter group is concerned about macroeconomic stability and the aggregate level of expenditure and deficits.

Line ministries are interested in donor projects as it alleviates their hard budget constraint. Since they do not bear the cost of this financing, they will accept the projects whether or not it fits within the sectoral strategy, if in fact there is one to begin with. The extent to which donors' project financing will be socially desirable will be a function of the extent to which it is based upon accurate information about social preferences and the extent to which there is donor coordination to support a mutually consistent composition of expenditures. In actual practice, donor assistance has been fragmented. Further, donor financing of particular types of expenditures has biased expenditure composition in these directions. In particular, donors have traditionally financed capital investments and line ministries have accepted them irrespective of whether existing investments receive adequate resources or whether the new investments can be appropriately maintained in the future. These perverse incentives have become institutionalized in the dual budget system that donors have supported. In particular, donors have supported the public investment program or PIP that has been inherently expansionary, as it has continued to finance an expanding government without concern for whether resources are there to finance existing or new investments. Over time, the concern about the insufficient funding for recurrent expenditures has led to the PIP budget effectively becoming merely an aid budget, with donors financing both recurrent and capital investments. But this has mitigated incentives for line ministries to themselves finance the recurrent budget. To ensure technical efficiency, donors have set up their own project-based enclaves of accountability with their own systems of financial accountability, procurement and auditing. However, the government's own systems for accountability have typically not been a focus in these systems.

Implications for institutional set up

In this context, the dominance of the central donors becomes an analogue to solve the tragedy of the commons within donor relationships with the government. In addition, donor conditionality on the aggregate spending and

deficit becomes a formal constraint to solve the government's own tragedy of the commons problem above, although the extent to which this conditionality is binding will in turn depend upon whether internal incentives within the central donors are conducive to holding government to macroeconomic stability. Institutional mechanisms to improve perverse incentives that may impede expenditure prioritization and technical efficiency include enhancing government capacity and incentives to set up its own strategic priorities based upon the expenditure-preference mapping; coordinated donor financing of a slice of government expenditures in an integrated manner without biasing expenditures towards one or the other; and improving accountability within government to achieve technically efficient results.

Preconditions and the rule of law

The institutional mechanisms that have been identified above to address key problems characterize an ideal public expenditure management system. It must be emphasized that such a system requires certain preconditions. Where such conditions are only weakly present some of the mechanisms may not be feasibly established. One precondition is a strong adherence of society to the rule of law. Where the rule of law is weak, rules are not likely to be effective no matter how well written and internally consistent they are. A related precondition is the freedom of the press. Publication of budget documents for public scrutiny and the results of surveys are biting only if the press is free to scrutinize them and raise questions about potential anomalies. But the press must also be responsible, i.e., able to support with evidence whatever it publishes. Otherwise its credibility is strained, which would lower the cost of agency malperformance. And finally, an often overlooked requirement is human capabilities. Some mechanisms require the use of highly skilled individuals to make things work, e.g., auditing, accounting, or cost-benefit analysis. An insufficient supply is likely to create bottlenecks in the system.

In effect, weaknesses in any of these conditions would be reflected in deficiencies in the public expenditure management system that the country may not be capable of addressing at the current time. Care must be taken then not to recommend improvements in the system without first looking at the preconditions.

Key questions for diagnosing institutional arrangements

The above framework helps identify institutional arrangements that can address the four key problems and thereby improve expenditure outcomes. With this framework, key questions can be identified to help diagnose the institutional features that will influence the aggregate level of spending, the prioritization or composition of spending and the technical efficiency in the use of budgeted resources. These include not only the formal and informal rules that ought to be examined, but also an examination of the accountability and transparency features associated with these rules that make them binding or ineffective. A questionnaire that can be used to structure this diagnosis can be found at the end of this chapter. However, it is important to note that this is a preliminary attempt drawn from ongoing research by Pradhan and Campos (forthcoming), and will need to be fine tuned over time.

To begin with, it is useful to describe the budgetary process, including the formal rules, relative roles of different players, the timetable of the budget cycle, the nature of the budget call circular, requirements for formal reporting, auditing and evaluation. Subsequently, it becomes important to probe deeper to understand how the budgetary system actually works—e.g., informal rules and practices, *ad hoc* or across-the-board cuts or increases, lags in financial reporting and auditing.

To identify whether there are rules or institutional arrangements that address the tragedy of the commons problem above and thereby enforce *aggregate fiscal discipline*, key questions would include (I) whether the budget is prepared based upon a macroeconomic framework; (ii) whether there exist formal constraints—constitutional (e.g., Indonesia) or donor conditionality (e.g., Ghana, Uganda)—on aggregate spending, deficits or borrowing; (iii) whether the central ministries have dominance in enforcing aggregate expenditure ceilings in budget preparation and execution, as measured by the percent deviation between their

proposals on the one hand, and actual budgetary submissions and expenditures on the other (e.g., Thailand); and (iv) whether there are limits on overspending by individual line ministries. While such rules may exist on paper, a key issue is whether they are binding. This requires assessing whether there is a reconciliation between *ex ante* and *ex post* outcomes (e.g., budgeted versus actual spending and deficits), whether there are sanctions to nonachievement of targets, and whether these are published and made public. An example of such a binding arrangement is New Zealand's Fiscal Responsibility Act that has legislative mandates for full and frequent fiscal disclosure. Preliminary evidence from cross-country, time-series data also suggests that openness of financial markets enhances fiscal discipline by making it costly for governments to overspend.

For *expenditure prioritization*, three main categories of questions can be identified to assess whether formal and informal rules are conducive to producing expenditure allocations that maximize social welfare. The first set of questions concerns the breadth of consultations and transparency with which actual budgetary priorities are established. In particular, are expenditure priorities primarily determined by the central ministries, the Cabinet, donors, or parliament, as measured by the percent deviation in expenditure composition made by these players during the budget cycle. Once again, formal rules can be deceptive. In several developing countries (e.g., Ghana), the formal budget that is approved by Parliament is merely a deceptive mirage. Overoptimism in the macroeconomic framework implies that expenditure cuts have to be made during budget implementation, with the result that the actual budget is remade arbitrarily during the year by a select few through the controller and accountant general's cash limits. The actual budget may therefore bear no resemblance to the original budget. Consequently, a key question to ask is what are the rules and consultations governing the resetting of priorities during budget implementation, what are the percent deviation between budgeted and actual expenditure composition, whether these are published and made public within a meaningful time frame, and whether there are sanctions against large deviations.

The second set of questions determines the basis on which expenditure priorities are based, and how macro versus micro tensions are resolved between the central and line ministries in making budgetary allocations. In particular, are expenditure priorities based upon the outcomes or results that are to be achieved on account of expenditure allocations? Is there an information base estimating the costs of achieving program outcomes? If so, are these published and made public to the society at large? Is there *ex post* evaluation as to whether these were achieved? Do line ministries allocate their resource envelope to achieve key sectoral priorities? Within this, a key question is whether there is a medium-term expenditure planning process (e.g., Uganda), which projects the medium-term macroeconomic framework and allocates expenditures to sectors and programs based upon strategic priorities. Even if this exists, it needs to be ascertained on what basis relative allocations are made. In particular, is there a system of forward estimates (e.g., Australia, ongoing reforms in Malawi) whereby line ministries articulate sectoral objectives, identify the appropriate role of government, and estimate the costs of achieving these objectives or outcomes. To see if such prioritization rules are binding, it would need to be assessed whether there is *ex post* reconciliation of expenditure allocations vis-a-vis budgeted priorities, whether there is *ex post* evaluation (e.g., Australia, ongoing reforms in Colombia) to ascertain whether intended outcomes were achieved, whether there are sanctions against nonachievement of outcomes, and whether these are published and made public.

The third set of questions pertains to the extent to which expenditure prioritization is donor-driven, and if so, what the incentives towards particular types of expenditures are. This requires identifying the percent of total public expenditures that are donor-financed, and the percent of donor projects that finance particular types of expenditures (e.g., capital investments) as opposed to financing a slice of the government's expenditure program. In addition, donor conditionality pertaining to expenditure composition needs to be identified. Finally, mechanisms for donor coordination in the financing of sectoral and intersectoral programs needs to be identified. In some countries (e.g., Malawi), lead donors have been identified for particular sectors that have the responsibility for coordinating donor assistance. In other countries (e.g., Ghana), donors are undertaking sector investment programs (SIPs) in which coordinated donor assistance finances a time slice of the government's

sectoral investment budget. However, it is unclear how well SIPs have been integrated into an overall medium-term expenditure framework of government.

For *technical efficiency*, a key issue is the adequacy of civil service wages and salaries, as measured by the public-private pay differential at various levels. As already discussed earlier, civil service pay is so low in many countries that civil servants do not have the incentives to perform (e.g., Uganda, Malawi, Ghana). Consequently, motivation and morale is low, and moonlighting is prevalent, leading to gross inefficiencies in service delivery. More broadly, technical efficiency will depend upon the autonomy and accountability of line agencies in service delivery. Relative autonomy would depend upon how much flexibility line agencies have in allocating their resources, including the ability to hire and fire. Key questions on accountability would be ascertaining whether there are financial accounts, financial audits, performance audits, and client surveys are carried out. If so, with what frequency and lags, and what have been the typical sanctions for nonperformance. Other features influencing accountability are whether the tenure of the chief executives of line agencies is permanent or fixed-term, and if the latter, whether it is linked to performance. Finally, accountability would be facilitated by the extent to which clients have options for exit, through competition from the private or public sectors. New Zealand offers the most radical illustration of institutional reform to enhance technical efficiency, where conglomerate ministries have been broken up into focused business units, commercial activities have been privatized throughout the public sector, contestability and competition in service delivery has been introduced to the extent feasible in the remaining core public sector, permanent secretaries of line agencies have been replaced by fixed-term chief executives, their performance contracts as well as budgetary appropriations have been explicitly linked to outputs, and they have been accorded autonomy to allocate inputs or expenditures to achieve these outputs.

Implications for public expenditure analysis

The preceding chapters identified many analytical and empirical difficulties that constrain an analysis of the level and composition of public spending. The discussion in this chapter sheds further light on this issue: information constraints plague the budgeting problem, making it a formidable challenge for an analyst or analysts to evaluate expenditure allocations. This further underscores the need to analyze institutional arrangements in the public expenditure management system to diagnose whether formal and informal rules are contributing to aggregate fiscal discipline, the prioritization or composition of expenditures, and technical efficiency in the use of budgeted resources. The discussion above suggests that several institutional features can be expected to contribute to improved outcomes, although ongoing empirical research will investigate whether these are indeed borne out by evidence. It appears, however, that some basic features of transparency, accountability and results-oriented budgeting in the public expenditure management system can potentially go a long way toward improving expenditure outcomes.

In sum, while analyzing the broad allocations of public spending, it is equally if not more critical to analyze the underlying institutional arrangements and support institutional reform that can improve expenditure allocations on a sustained basis.

DIAGNOSTIC QUESTIONNAIRE

Ed Campos and Sanjay Pradhan

1. Aggregate Fiscal Discipline

A. Budget preparation and approval

1a. Are there formal constraints (constitutional or legislatively mandated) on aggregate spending and/or deficits?

1b. Is the government required to publish actual figures relative to these constraints?

1c. Are these constraints imposed and monitored by donors?

2a. Are there formal constraints (constitutional or legislatively mandated) on public debt and domestic/external borrowing by (i) central government; (ii) subnational governments; and (iii) public enterprises?

2b. Is this monitored by the Central Bank?

2c. Are these constraints imposed and monitored by donors?

2d. Is the government required to publish actual figures relative to these borrowing constraints?

3a. Is there a medium-term expenditure framework which projects an aggregate expenditure ceiling over a three- to five-year horizon, consistent with the macroeconomic targets?

3b. Is this published?

3c. What is the percent difference between the aggregate spending in the medium-term projection and that in the annual budget?

4a. What is the percent deviation between the aggregate spending in the budget as proposed by the central agencies (i.e., Minister of Finance in the Budget Call Circular) and that approved by cabinet at the end of budget discussions?

4b. What is the percent deviation between aggregate spending proposed by the cabinet and the legislature?

B. Budget execution and monitoring

1a. Is there formal rules that guard against overspending by agencies relative to budgeted amounts (e.g., central agencies, chief accountants or banks having the authority to refuse expenditures if there are insufficient funds in the ministerial account)?

1b. Is there a published reconciliation of actual expenditures versus budgeted amounts?

1c. Is there punitive action taken against overspending agencies?

2a. Is there a formal or informal requirement to report on aggregate fiscal outcomes relative to targets?

2b. Are these published?

2c. If so, with what lags?

2d. What is the percent deviation between the aggregate spending in the annual budget and the total amount actually spent at the end of the fiscal year?

2. Expenditure Prioritization and Allocative Efficiency

A. Budget preparation and approval—breadth of consultations

1a. What percent of expenditures are allocated by the central government (as opposed to subnational governments)?

1b. Which of these activities do subnational governments have constitutional responsibility for in allocating their budgetary expenditures: (i) primary education, (ii) secondary education, (iii) university education, (iv) hospitals, (v) health clinics? Check only those which apply.

2a. Are there explicit pre-budget consultations about budgetary priorities between government and the following groups in the private sector: (i) business community; (ii) public interest groups (e.g., NGOs); (iii) labor unions; (iv) farmers' associations? Check only those which apply.

2b. How large a change vis-a-vis existing priorities in the current budget have emerged from such consultations: negligible, modest or large?

2c. Are there post-budget consultations with the same group which attempt to reconcile pre-budget understandings with actual allocations?

3a. At the start of budget preparation, is there a session in the legislature about budget priorities?

3b. How large a change vis-a-vis existing priorities in the current budget have emerged from such a session: negligible, modest or large?

4a. Rank the following in terms of their relative influence of the following in deciding upon broad priorities for the composition of expenditures: (i) Ministry of Finance/Planning; (ii) the Cabinet; (iii) the Legislature; (iv) Donors; (v) private sector-government consultation committees.

4b. What is the average percent deviation in the allocation for major sectors and programs (i) between the budget as proposed by the central ministries and that by the cabinet, and (ii) between the budget as proposed by cabinet and that approved by the legislature? Range: negligible (0-10%), modest (10-30%), high (more than 30%).

5a. Does the government publish expenditure priorities corresponding to the following levels of disaggregation: (i) sector expenditures; (ii) programs; (iii) projects? Check only those that apply.

5b. If so, are these expressed in terms of outcomes (i.e., impact on beneficiaries—e.g., infant mortality) or outputs (i.e., goods and services produced—e.g., number of health clinics or immunizations provided)?

5c. Are actual achievements of sectoral expenditures published?

5d. If so, is there a public or published reconciliation with the targets?

6a. What percentage of public spending is financed by donors?

6b. Is there a prior agreement among donors about the composition of expenditures that are being collectively financed?

6c. If so, is this agreement induced by the leadership of a central donor?

B. Budget preparation and approval—allocation rules and criteria

1a. Are expenditure allocations across ministries and programs increased or decreased in the same proportion across-the-board?

1b. Are there formulae or rules which earmark funds for specific expenditures? What proportion of total expenditures do they constitute?

2a. Is there a formal or informal rule which requires an explicit consideration of whether individual programs or projects that are to be funded by the budget can be undertaken by the private sector?

2b. For which sectors is this done? For what percentage of programs/projects is this actually done (100%, 50-99%, 20-49%, less than 20%)?

3a. Is there a requirement to conduct an *ex ante* quantitative analysis of costs and benefits before a new program/project is initiated?

3b. For which sectors is this done? Indicate the percentage of programs/projects for which this is actually done (100%, 50-99%, 20-49%, less than 20%)?

4a. Is the distributional impact of public spending explicitly quantified and considered in allocating resources among programs and projects?

4b. For which sectors is this done? Indicate the percentage of programs/projects for which this is actually done (100%, 50-99%, 20-49%, less than 20%)?

C. Budgeting preparation and approval—norms

1a. Is there a system of forward estimates which projects the future cost implications of existing and proposed programs and projects?

1b. Are these automatically rolled over into the next budget, adjusted only for key national parameters such as inflation rate?

1c. Are these forward estimates published?

1d. Does the government publish a reconciliation statement explaining any significant deviations in the composition of expenditures between the original forward estimates and the annual budget?

2a. Are line agencies required to identify cuts in their existing programs to match new spending proposals?

2b. Are various new spending proposals and offsetting cuts discussed systematically at a Cabinet or sub-Cabinet level?

D. Budgeting preparation and approval—capital/recurrent budgeting

1a. Are there separate budgets for capital and recurrent expenditures?

1b. Is there a requirement to estimate the recurrent cost implications of new capital investments?

1c. Are there different ministries responsible for preparing capital budgets (e.g., Ministry of Planning) and recurrent budgets (e.g., Ministry of Finance)?

1d. What percent of public investments is donor financed?

E. Budgeting preparation and approval—donor rules

1a. Is there donor conditionality on the overall composition of expenditures?

1b. Has expenditure composition been changed in accordance with this conditionality?

1c. What percent of donor financed expenditures are earmarked for particular programs and projects?

F. Budget execution and monitoring

1a. What is the average percent deviation between the composition of expenditures as approved in the annual budget and the actual allocation at the end of the budget year?

1b. On what basis was the composition changed: (i) arbitrary/*ad hoc*; (ii) related to specific problems?

1c. What was the relative role of the following in inducing these changes: (i) Ministry of Finance/Planning; (ii) the Cabinet; (iii) the Legislature; (iv) private sector-government consultation committees? Rank these in order of importance, with 1 for the least influence and 4 the most.

2a. Is there a requirement for carrying out *ex post* evaluation of programs/projects? By whom: central agencies, line agencies, or by independent external agencies? Check all those that apply.

2b. For what percentage of programs/projects (100%, 50-99%, 20-49%, less than 20%)?

2c. Are the results used in expenditure allocations for the next budget?

2d. Are the results of *ex post* evaluations published?

3a. Are client surveys routinely carried out as part of these evaluations?

3b. For which ministries or services?

3c. With what frequency?

3d. Are the results published?

3. Technical Efficiency

A. Autonomy

1a. What is the percent and type of expenditure items over which line agencies have flexibility in allocating budgetary resources during budget preparation?

2a. During budget implementation, what percent of budgeted allocations are automatically released to line agencies?

2b. What percentage of items require additional documentation and approval from the central agencies?
2c. How much time (in weeks) does it take on average to secure approval for these items?

3a. What is the frequency of turnover over the last 15 years of heads of agencies for health, education and transport?

3b. Whenever there is a change in government, is there a corresponding change in personnel in line agencies? If so, how deep do these personnel changes go? Check all those that apply.

B. Accountability

1a. Is there a clear specification of the output to be produced by: (i) a ministry; (ii) a department within a ministry; and (iii) a division, program or project unit within a department?

1b. If so, are these outputs published?

2a. Are performance indicators specifically linked to senior managers' (i) tenure; (ii) promotion; and (iii) compensation?

2b. Are these performance indicators based on the achievement of outputs (i.e., goods and services produced—e.g., number of immunizations or health clinics) or outcomes (i.e., impact on beneficiaries—e.g., lower infant mortality). Check all that apply.

2c. Have chief executives been fired on account of nonperformance?

3a. What is the percentage deviation between public and private pay for different grade levels?

3b. Is there an explicit link between pay and performance?

4a. Is competitive bidding required for the procurement of major expenditure items?

4b. Are the rules for bidding made public?

5a. When are financial accounts of line agencies prepared: (i) quarterly during the budget year; (ii) semestral during the budget year; (iii) within six months from the end of the fiscal year; (iv) more than six months but less than one year; (v) between one and three years; (vi) more than three years.

5b. Are there punitive actions taken against (i) delays; and (ii) discrepancies?

5c. Are these accounts tabled before a separate session of the Legislature?

5d. Are they made public?

6a. Are the agency accounts audited?

6b. If so, by whom: internal agency auditor, the government auditor within the Executive, independent auditor? Check all that apply.

6c. When are audits of agency accounts undertaken : (i) quarterly during the budget year; (ii) semestral during the budget year; (iii) within six months from the end of the fiscal year; (iv) more than six months but less than one year; (v) between one and three years; (vi) more than three years.

6d. What percent of programs have been audited in the last five years?

6e. What percent are financial audits as opposed to performance audits?

6f. Are the results published?

6g. Has there been punitive action or promotion based on these audits?

7a. Are there client surveys undertaken?

7b. How frequently?

7c. Are the results published?

7d. Do these surveys measure satisfaction with service delivery (i.e., outputs), or with success of the program (i.e., outcomes), or both? Check all that apply.

8a. How many major donors provide project financing? Indicate the number.

8b. Do these projects specify the amount and type of expenditures on which project resources will be spent?

8c. Does each donor have its own rules about disbursement, procurement, accounting and auditing of project funds?

8d. Do these rules match those of the government?

BIBLIOGRAPHY

Adler, Hans. 1987. *Economic Appraisal of Transport Projects: A Manual of Case Studies*. Baltimore: Johns Hopkins University Press.

Aschauer, D. 1989. "Is government spending productive?" *Journal of Monetary Economics* 23:177-200.

_____, and J. Greenwood. 1985. "Macroeconomic effects of fiscal policy." *Carnegie-Rochester Conference Series on Public Policy* 23:91-138.

Ashenfelter, Orley. 1992. "How convincing is the evidence linking education and income?" Draft, Princeton University.

_____, and Alan Krueger. 1992. "Estimates of the Economic Return to Schooling from a New Sample of Twins." NBER Working Paper No. 4143.

Baffes, John, and Anwar Shah. 1993. "Productivity of Public Spending, Sectoral Allocation Choices, and Economic Growth." Policy Research Working Papers, No. 1178. The World Bank, Washington, D.C.

Bandyopadhyay, Sushenjit, and Shantayanan Devarajan. 1993. "Comparing Project Rates of Return Across Sectors." Draft.

Barro, R. J. 1990. "Governmental spending in a simple model of endogenous growth." *Journal of Political Economy* 98:S103-S125.

_____. 1991. "Economic growth in a cross section of countries." *Quarterly Journal of Economics* 106:407-44.

Behrman, J., and Nancy Birdsall. 1983. "The quality of schooling: Quantity alone is misleading." *American Economic Review* 73:928-46.

Benoit, E. 1978. "Growth and Defense in Developing Countries." *Economic Development and Cultural Change* 26(2):271-80.

Bhalla, Surjit S., and Indermit S. Gill. 1990. "Social Expenditure Policies and Welfare Achievement in Developing Countries." A background paper for the 1991 World Development Report, World Bank, Washington, D.C.

Binswanger, Hans, and others. 1989. "Output and Investment in Indian Agriculture: Effects of Agroclimate, Infrastructure, Banks and Prices." Latin America and the Caribbean Country Department III, Agriculture Operations Division. The World Bank, Washington, D.C.

_____. 1987. "On the Determinants of Cross-country Aggregate Agricultural Supply." *Journal of Economics* 36:111-31.

Bird, Andrew, and Mike Stevens. 1991. "Budgeting for O & M." CESPS/EDI Training Brief (October 3, 1991). World Bank, Washington, D.C.

_____, and Mike Stevens. 1991. "Preparing a Public Investment Program." CESPS/EDI Training Brief (October 3, 1991). World Bank, Washington, D.C.

Canning, David, and Marianne Fay. 1993a. "The Effect of Infrastructure Networks on Economic Growth." Department of Economics, Columbia University, New York.

_____. 1993b. The Effect of Transportation Networks on Economic Growth." Discussion Paper Series (May), Department of Economics, Columbia University, New York.

Chu, Ke-young, and Richard Hemming, eds. 1991. *Public Expenditure Handbook: A Guide to Public Expenditure Policy Issues in Developing Countries*. International Monetary Fund, Government Expenditure Analysis Division, Fiscal Affairs Department, Washington, D.C.

Cox, Donald, and Emmanuel Jimenez. 1995. "Private Transfers and the Effectiveness of Public Income Redistribution in the Philippines." In Dominique van de Walle and Kimberly Nead, eds., *Public Spending and the Poor: Theory and Evidence*. Baltimore: Johns Hopkins University Press.

Deger, S. 1986. *Military Expenditure in Third World Countries: The Economic Effects*. Boston: Routledge & Kegan Paul.

de Melo, Martha. 1988. "Public Investment/Expenditure Reviews: The Bank's Experience." World Bank, Public Economics Division, Country Economics Department, Washington, D.C.

Devarajan, Shantayanan, Vinaya Swaroop, and Heng-fu Zou. 1995. "The Composition of Public Expenditure and Economic Growth." Policy Research Department, Public Economics Division. The World Bank, Washington, D.C.

_____, Lyn Squire, and Sethaput Suthiwart-Narueput. 1995. "Reviving Project Appraisal at The World Bank." Policy Research Working Papers No. 1496. The World Bank, Washington, D.C.

Diamond, J. 1989. "Government Expenditure and Economic Growth: An Empirical Investigation." IMF Working Paper No. 89/45. Washington, D.C.

Easterly, William, and Klaus Schmidt-Hebbel. 1991. "The Macroeconomics of Public Sector Deficits: A Synthesis." Working Paper No. 775. World Bank, Country Economics Department, Washington, D.C.

_____, and Sergio Rebelo. 1993. "Fiscal Policy and Economic Growth: An Empirical Investigation." *Journal of Monetary Economics* 32:417-58.

Faini, R., P. Annez, and L. Taylor. 1984. "Defense Spending and Economic Growth in LDCs." *Journal of Conflict Resolution* 33:318-45.

Fisher, Stanley, and William Easterly. 1990. "The Economics of The Government Budget Constraint." *The World Bank Research Observer* 5(2):127-42.

Glewwe, Paul, and H. Jacoby. 1992. "Estimating the Determinants of Cognitive Achievement in Low-income Countries." LSMS Working Paper No. 91. The World Bank, Washington, D.C.

Grier, K., and G. Tullock. 1987. "En Empirical Analysis of Cross-national Economic Growth, 1951-1980." *Journal of Monetary Economics* 24 259-76.

Hammer, Jeffrey, Ijaz Nabi, and James Cercone. 1995. "Distributional Effects of Social Sector Expenditures in Malaysia, 1974 to 1989." In Dominique van de Walle and Kimberly Nead, eds., *Public Spending and the Poor: Theory and Evidence*. Baltimore: Johns Hopkins University Press.

_____. 1993a. "Prices and Protocols in Public Health Care." Working Paper No. 1131. The World Bank, Washington, D.C.

_____. 1993b. "The Economics of Malaria Control." *The World Bank Research Observer* 8(1):1-22.

_____, and Peter Berman. 1993. "Ends and Means in Public Health Policy in Developing Countries." Paper presented at conference on Health Sector Reform in Developing Countries: Issues for the 1990s, New England Center, September 10-13. Durham, New Hampshire.

Hanushek, Eric A. 1995. "Interpreting Recent Research on Schooling in Developing Countries." *The World Bank Research Observer* 10(2):227-46.

Harbison, Ralph W., and Eric A. Hanushek. 1992. *Educational Performance of the Poor: Lessons from Rural Northeast Brazil*. Published for The World Bank: Oxford University Press.

Heller, Peter S. 1975. "Issues in the Costing of Public Sector Outputs: The Public Medical Services of Malaysia." Staff Working Paper No. 207. World Bank, Washington, D.C.

_____. 1979. "The Underfinancing of Recurrent Development Costs." *Finance and Development* 16. International Monetary Fund, Washington, D.C.

_____. 1991. "Operations and Maintenance." In Chu and Hemming, eds. *Public Expenditure Handbook: A Guide to Public Expenditure Policy Issues in Developing Countries*. International Monetary Fund, Government Expenditure Analysis Division, Fiscal Affairs Department, Washington, D.C.

Holmes, Malcolm. 1994. "Improving Budgetary Capacity." Note for Training Seminar. The World Bank.

Holtz-Eakin, D. 1991. "Public-sector capital and the productivity puzzle." Draft. Syracuse University, New York.

Humplick, Frannie, and William D.O. Paterson. 1994. "Framework of Performance Indicators for Universal Use: Indicators for Managing Pavements." Third International Conference on Managing Pavements, Conference Proceedings, Volume 1. Transportation Research Board, National Research Council, Washington, D.C.

_____, and Asif Faiz. 1994. "Strategies for Managing Expenditures for Road Maintenance."Conference Proceedings, Maintenance Management, Volume 5. Transportation Research Board, National Research Council, Washington, D.C.

International Monetary Fund. 1995. *Government Finance Statistics: Yearbook*. Washington, D.C.

_____. 1995. "Unproductive Public Expenditures." Pamphlet Series No. 48. Washington, D.C.

James, Estelle. 1991. "Private Higher Education: the Philippines as a Prototype." *Higher Education* 21:189-206.

_____. 1987. "The Public/Private Division of Responsibility for Education: An International Comparison." *Economics of Education Review* 6(1):1-14.

Jimenez, Emmanuel. 1995. "Human and Physical Infrastructure: Public Investment and Pricing Policies in Developing Countries." *Handbook of Development Economics*, Vol. III, Chapter 43.

_____, and Marlaine E. Lockheed, eds. 1991. "Private Versus Public Education: An International Perspective." *Int. J. Educ. Res.* 15:353-498.

_____. 1987. *Pricing Policy in the Social Sectors*. Baltimore and London: Published for The World Bank by The Johns Hopkins University Press.

Kessides, Christine. 1995. "The Contributions of Infrastructure to Economic Development: A Review of Experience and Policy Implications." World Bank Discussion Paper (forthcoming). Urban Development Division, Transportation, Water and Urban Development Department. Washington, D.C.

Kim, Aehyung. 1993. "Cost-benefit Analysis of the Onchocerciasis Control Programme (OCP)." Draft. World Bank, Washington, D.C.

King, Elizabeth M., and James P. Smith. 1988. *Computing Economic Loss in Cases of Wrongful Death*. California: The Rand Corporation.

Kormendi, R.C., and P.G. Meguire. 1985. "Macroeconomic Determinants of Growth: Cross-country Evidence." *Journal of Monetary Economics* 16:141-64.

Kremer, Michael R. 1995. "Research on Schooling: What We Know and What We Don't, A Comment on Hanushek." *The World Bank Research Observer* 10(2):247-54.

Landau, Daniel. 1993. "The Economic Impact of Military Expenditures." Policy Research Working Papers, No. 1138. The World Bank, Washington, D.C.

Lim, D. 1983. "Another Look at Defense and Growth in Less Developed Countries." *Economic Development and Cultural Change* 31(2):377-84.

Lindauer, David L., and Barbara Nunberg, eds. 1993. *Rehabilitating Government: Pay and Employment Reform in Developing Economies*.

Little, Ian M.D. and James A. Mirrlees. 1974. *Project Appraisal and Planning for Developing Countries*. London: Heinemann Educational Books.

_____, and James A. Mirrless. 1968. *Manual of Industrial Project Analysis in Developing Countries*. Volume II, *Social Cost Benefit Analysis*. Paris: OECD.

McNamara, Robert. 1991. "The Post-Cold War World and Its Implications for Military Expenditures in the Developing Countries." Annual Conference on Development Economics, The World Bank, Washington, D.C.

Meerman, Jacob. 1979. *Public Expenditure in Malaysia: Who Benefits and Why*. New York: Oxford University Press.

Milanovic, Branko. 1995. "The Distributional Impact of Cash and In-Kind Transfers in Eastern Europe and Russia." In Dominique van de Walle and Kimberly Nead, eds., *Public Spending and the Poor: Theory and Evidence*. Baltimore: Johns Hopkins University Press.

Mingat, Alain, and Jee-Peng Tan. 1988. *Analytical Tools for Sector Work in Education*. Published for The World Bank. Baltimore: Johns Hopkins University Press.

_____, and Jee-Peng Tan. 1986. "Who Profits from the Public Funding of Education: A Comparison of World Regions." *Comparative Education Review* 30(2):260-70.

Morrison, C., and A.E. Schwartz. 1991. "State Infrastructure and Productive Performance." Draft. Tufts University.

Musgrave, Philip. 1988. "Is Polio Eradication in the Americas Econoimcally Justified?" *Pan American Health Organization Bulletin* 22(1):1-16.

Nunberg, Barbara. 1988. "Public Sector Pay and Employment Reform." Working Paper No. 113. World Bank, Country Economics Department, Washington, D.C.

Over, A. Mead. 1991. *Economics for Health Sector Analysis: Concepts and Cases*. World Bank, Economic Development Institute, Washington, D.C.

Pradhan, Sanjay, and Ed Campos. 1995. "The Impact of Budgetary Institutions on Expenditure Outcomes: A Research Proposal." Policy Research Department, Public Economics Division. The World Bank, Washington, D.C.

_____. 1994. "Project Evaluation Revisited." World Bank, Policy Research Department, Public Economics Division, Washington, D.C.

_____, and J. Pillai-Essex. 1993. "Agriculture Public Expenditure Review." Draft paper. The World Bank, D.C.

_____. 1992. "Ukraine: Issues in the Level and Composition of Spending." Background Paper. Policy Research Department, Public Economics Division. The World Bank, Washington, D.C.

_____, and Vinaya Swaroop. September 1992. "Structural Adjustment and the Level and Composition of Public Expenditures." In Adjustment Lending and Mobilization of Private and Public Resources for Growth. The World Bank, Washington, D.C.

Premchand, A. 1993. *Public Expenditure Management*. International Monetary Fund, Washington, D.C.

Psacharopoulos, George. 1993. "Returns to Investment in Education: A Global Update." Working Paper No. 1067. Policy Research, Latin America and the Caribbean. World Bank, Washington, D.C.

_____, ed. 1987. *Economics of Education: Research and Studies*. New York: Pergamon Press.

_____. 1981. "Returns to Education: An Updated International Comparison." *Comparative Education* 17(3):321-41.

Ravallion, Martin, and Gaurav Datt. 1995. "Is Targeting through a Work Requirement Efficient: Some Evidence for Rural India." In Dominique van de Walle and Kimberly Nead, eds., *Public Spending and the Poor: Theory and Evidence*. Baltimore: Johns Hopkins University Press.

Sahn, David E., and Harold Alderman. 1995. "Incentive Effects on Labor Supply of Sri Lanka's Rice Subsidy." In Dominique van de Walle and Kimberly Nead, eds., *Public Spending and the Poor: Theory and Evidence*. Baltimore: Johns Hopkins University Press.

Selowsky, Marcello. 1979. *Who Benefits from Government Expenditures: A Case Study of Colombia*. New York: Oxford University Press.

Shah, Anwar. 1994. "The Reform of Intergovernmental Fiscal Relations in Developing and Emerging Market Economies." Policy and Research Series No. 23. The World Bank, Washington, D.C.

Shepard, Donald S., and others. 1991. "The economic cost of malaria in Africa." *Tropical Medicine and Parasitology* 42:199-203.

Stevens, Michael. April 1994. "Public Investment Programs." Operations Policy Department. The World Bank, Washington, D.C.

_____. 1993. "Preparing for Civil Service Pay and Employment Reform: A Primer." In Lindauer and Nunberg, eds. 1993. *Rehabilitating Government: Pay and Employment Reform in Developing Economies*.

Squire, Lyn. 1989. "Project Evaluation in Theory and Practice." In H. Chenery and T.N. Srivinasan, eds., *Handbook of Development Economics*, Volume II. Elsevier Science Publishers, B.V.

Schwartz, Antoine, and Gail Stevenson. 1990. "Public Expenditure Reviews for Education: The Bank's Experience." Working Paper No. 510. Population and Human Resources Department. World Bank, Washington, D.C.

Summers, R., and A. Heston. 1988. "A New Set of International Comparisons of Real Product and Price Levels: Estimates for 130 Countries." *The Review of Income and Wealth* 34:1-25.

Tan, Jee-Peng, and Alain Mingat. 1992. "Education in Asia: A Comparative Study of Cost and Financing." World Bank Regional and Sectoral Studies. Washington, D.C.

United Nations, UNESCO. 1988. "Current Surveys and Research in Statistics: Education Statistics." Division of Statistics on Education, Office of Statistics.

United Nations Industrial Development Organization (UNIDO). 1972. *Guidelines for Project Evaluation*. New York: United Nations.

United Nations. 1992. *The Control and Management of Government Expenditure*. Development Papers 13. Bangkok: UN Publications.

van de Walle, Dominique and Kimberly Nead, eds. 1995. *Public Spending and the Poor: Theory and Evidence*. Published for The World Bank. Baltimore and London: Johns Hopkins University Press.

_____. 1995. "Public Spending and the Poor: What We Know, What We Need to Know." Policy Research Working Papers, No. 1476. The World Bank, Washington, D.C.

van der Windt, N. 1995. "Strengthening Budget Management in SPA Countries." Analytical Methods, Macro-Economics and International Trade Department, Netherlands Economic Institute, Rotterdam.

Viscusi, W. Kip. 1993. "The Value of Risks to Life and Health." *Journal of Economic Literature* Vol. XXXI: 1912-46.

Verspoor, Adriaan, and Kin Bing Wu. 1990. "Textbooks and Educational Development." PHREE Background Paper Series No. 31. Education and Employment Division, Population and Human Resources Department. World Bank, Washington, D.C.

Weale, Martin. 1992. "Education, Externalities, Fertility and Economic Growth." Policy Research Working Papers, No. 1039. The World Bank, Washington, D.C.

Wilson, David N. 1990. "The Deleterious Impact of Rate-of-Return Studies on LDC Education Policies: An Indonesian Case." *Canadian and International Education* 19(1):32-49.

World Bank. 1988. *World Development Report: Opportunities and Risks in Managing the World Economy.* Washington, D.C.

World Bank. 1990a. *World Development Report: Poverty.* Washington, D.C.

World Bank. 1990b. *Proceedings of the Annual Conference on Development Economics.* Washington, D.C.

World Bank. 1991a. "Reform of Public Sector Management: Lessons from Experience." Policy and Research Series Paper No. 18. Country Economics Department, Washington, D.C.

World Bank. 1991b. "Uganda: Public Choices for Private Initiatives." Report No. 9203-UG. Washington, D.C.

World Bank. 1991c. *World Development Report: The Challenge of Development.* Washington, D.C.

World Bank. 1992a. "Adjustment Lending and Mobilization of Private and Public Resources for Growth." Policy and Research Series Paper No. 22. Country Economics Department, Washington, D.C.

World Bank. 1992b. "Malaysia: Fiscal Reform for Stable Growth." Report No. 10120-MA. East Asia and Pacific Region. Washington, D.C.

World Bank. 1992c. "Uganda: Managing Public Expenditure." Report No. 10512-UG. Eastern Africa Department, Africa Regional Office, Washington, D.C.

World Bank. 1993. *World Development Report: Investing in Health.* Washington, D.C.

World Bank. 1994a. "Ethiopia: Public Expenditure Policy for Transition." Report No. 12992-ET. Africa Region. Washington, D.C.

World Bank. 1994b. "Lithuania: Public Expenditure Review." Europe and Central Asia Region. Washington, D.C.

World Bank. 1994c. "Peru: Public Expenditure Review." Report No 13190-PE. Country Department III, Latin America and Caribbean Region. Washington, D.C.

World Bank. 1994d. "Tanzania: Role of Government. Public Expenditure Review." Report No. 12601-TA. Country Operations Division, Eastern Africa Department, Africa Region, Washington, D.C.

World Bank. 1994e. *World Development Report: Infrastructure for Development.* Washington, D.C.

World Bank. 1995a. "Guinea: Public Expenditure Review." Draft Report.Washington, D.C.

World Bank. 1995b "Namibia: Public Expenditure Review." Report No. 13558-NAM. Southern Africa Department, Africa Region. Washington, D.C.

World Bank. 1995c "Priorities and Strategies for Education: A World Bank Review." Washington, D.C.

World Bank. 1995d "Review of Public Expenditure Work." Office of the Vice President, Development Economics. Washington, D.C.

APPENDIX

SOME DATA REQUIREMENTS FOR PUBLIC EXPENDITURE ANALYSIS

Table A.1: Summary of Government Finance

	t-n	*t*	*t+2*
Total revenue and grants			
Revenue			
Tax revenue			
Non-tax revenue			
Grants			
Total expenditure			
Current expenditure			
Wages and salaries			
Other goods and services			
Subsidies			
Interest			
Capital expenditure			
Financing			
External (net)			
Gross borrowing			
Debt relief			
Amortization			
Domestic			
Banking system			
Nonbank sources			
Others & residual			

Table A.2: Economic Classification of Expenditures

	t-1	*t*	*Comparator A*	*Comparator B*
Current expenditures				
Expenditures on goods & services				
Wages and salaries				
Employer contributions (social security				
Other goods and services				
Interest Payments				
Subsidies				
Other current transfers				
Capital expenditures				
Lending minus repayments				

Table A.3: Functional Classification of Expenditures

	t-1	*t*	*Comparator A*	*Comparator B*
Economics services				
Transportation				
Fuel and energy services				
Agriculture, forestry & fisheries				
Mining and manufacturing				
Social services				
Education				
Health				
Social security & welfare				
Water supply & sanitation				
General public services				
Defense				
Public order & safety				
General public administration				
Other functions				
Interest				
General transfers				

Table A.3a: Functional Composition of Expenditures by Level of Government

	Central Gov't.	*State Gov't.*	*Local Gov't.*
Economics services			
Transportation			
Fuel and energy services			
Agriculture, forestry & fisheries			
Mining and manufacturing			
Social services			
Education			
Health			
Social security & welfare			
Water supply & sanitation			
General public services			
Defense			
Public order & safety			
General public administration			
Other functions			
Interest			
General transfers			

Table A.4: Health Outcomes and Indicators

	t-1	*t*	*Comparator A*	*Comparator B*
Mortality rates: infant, child, maternal mortality rates				
Life expectancy at birth				
Burden of disease				
DALY lost from communicable diseases				
Tuberculosis				
STDs and HIV				
Diarrhea				
Malaria				
Vaccine-preventable childhood infections				
Etc.				
DALY lost from noncommunicable diseases				
Cancer				
Etc.				
Incidence of severe diseases				
Health outcomes of the poor				
Incidence of disease by poor				
Access to health facility by poor				

Table A.5: Functional Composition of Health Spending
(nominal, real, percent GDP, percent GE)

	t-1	*t*	*Comparator A*	*Comparator B*
Expenditures by facilities				
Headquarters/Ministry				
Specialized hospitals				
District hospitals				
Health centers and clinics				
Vertical Programs				
Expenditures by program				
General administration				
Public health				
Immunizations				
School-based health services				
Family planning and nutrition				
AIDS Prevention				
Programs to reduce tobacco and alcohol prevention				
Clinical services				
Pregnancy-related care				
Family planning services				
Tuberculosis control				
Control of STDs				
Common serious illness of young children: diarrheal disease, acute respiratory infection, measles, malaria, acute malnutrition				
Tertiary care				
Specialized care				
Advanced surgery, etc.				
Total health expenditures				

Table A.6: Private Sector Supply in Health

Type of facility (specialized, district, health center)	*t-1*	*t*	*t+1*
Number of private health facilities			
Percent treated in private facilities			
Unit costs in private facilities			
Fees in private facilities			

Table A.7: Fees and Cost Recovery

	t-2	*t-1*	*t*	*t+1*
Specialized hospitals				
Average user Charge				
Percent of unit cost				
Total cost recovery				
District hospitals				
Average user charge				
Percent of unit cost				
Total cost recovery				
Health center				
Average user charge				
Percent of unit cost				
Total cost recovery				

Table A.8: Household Survey Data for Benefit Incidence Analysis

Household survey data (by income group, rural/urban, gender)	*t-2*	*t-1*	*t*	*t+1*
Percent use of type of health facility, by public/private				
Specialized hospital				
District hospital				
Health center				
Costs incurred				
Fees				
Travel cost				
Average distance to health facility				
Disease Burden by household group: DALY lost by cause				
Tuberculosis				
STD and HIV				
Diarrhea				
Vaccine-preventable childhood infections				
Malaria				
Etc.				
Contingent valuation survey for risk reduction				
Willingness to pay for reduced mortality risk				
Willingness to pay for reduced morbidity risk				

TableA.9: Education Outcomes and Indicators

	t-n	*t*	*Comparator A*	*Comparator B*
Student flows				
Gross enrollment				
By gender				
By poor				
Net enrollment				
Completion/Promotion rate				
Dropout rates				
Cognitive				
Ave. standardized achievement test scores				

Table A.10: Economic Composition of Education Spending
(nominal, real, percent GDP, or percent TGE)

Sector, facility or program level	*t-1*	*t*	*t+1*	*t+2*
Wages and salaries				
Teachers				
Administrators				
Others				
Other goods and services				
Non-wage O&M				
Textbooks				
Supplies				
Maintenance of facilities				
Miscellaneous				
Subsidies				
Feeding costs				
Allowances for expenses				
Scholarships				
Merit-based				
Income/Need-based				
Capital expenditures				
Building repair				
Building rehabilitation				
New construction				
Equipment				
Libraries				

Table A.11: Functional Composition of Education Spending
(nominal, real, percent GDP, percent GE)

	t-1	t	t+1	t+2	Comparator A	Comparator B
Expenditures by program (functional)						
General administration						
Pre-primary education						
Primary education						
Secondary general education						
Secondary vocational/technical						
Secondary teacher training						
Higher/university education						
Total education expenditures						

Table A.12: Unit Costs in Education

Wages and salaries						
Teacher salaries and allowance						
Administrators						
Instructional materials						
Subsidies						
Feeding costs						
Allowances						
Capital expenditures						

Table A.13: Private Sector Supply in Education

Type of facility (primary, secondary, university)
Number of private education facilities
Gross enrollment in private schools
Unit costs in private schools
Fees in private schools
Output/outcome in private schools

Table A.14: Fees and Cost Recovery

	t-n	*t-1*	*t+1*	*t+2*
Universities				
Average fees				
Percent of unit cost				
Total cost recovery				
Secondary education				
Average fees				
Percent of unit cost				
Total cost recovery				
Primary education				
Average fees				
Percent of unit cost				
Total cost recovery				

Table A.15: Household Survey Data for Benefit Incidence Analysis

Household Survey Data (by income group, rural/urban, gender)
Percent use of type of education facility, by public/private
University
Secondary education
Primary education
Costs incurred
Fees
Travel cost
Average distance to school
Educational outcomes by income group
Gross enrollment
Net enrollment
Completion/promotion rates
Dropout rates

Table A.16: Data for Civil Service Employment Analysis

Employment	*t-10*	*t-5*	*t*	*t+1*
By Ministry/dept./program				
By service				
Civil service				
Teaching service				
Local government				
Health workers				
By salary grade				
Grade 1				
Grade 2				
Grade 3				

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